

AUGUST
21, 1913

10 CENTS A COPY

MOTOR AGE





Price, \$15.00

Over 53,000 Ford Owners Have That
SATISFIED FEELING



Because They Use The
Master Vibrator

which gives



**A Hotter Spark More Power
A Smoother Running Engine
Less Carbon Deposits Easier Starting
Cleaner Spark Plugs**

An honest article at a fair price—large, powerful condenser, genuine solid platinum-iridium points of generous size, strongly built kick switch—

The Standard By Which All Others Are Judged

OUR GUARANTEE—Try the K-W Master Vibrator for 30 days and if you can get along without it, return it and we will give you your money back and ask no questions.

SEND FOR DESCRIPTIVE FOLDER.

Improve the efficiency and appearance of your car by installing a

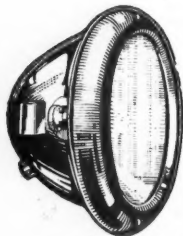


Electric Headlight Outfit

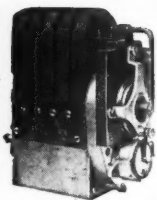
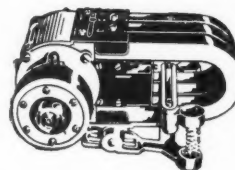
\$40

Complete Outfit, Electric Generator, Headlamps, Switch, Wire and Bulbs.

Ford Outfit For Fly-Wheel Magneto, \$15.00



The K-W Generator can be easily installed on any car having exposed fly-wheel or other convenient place to belt or friction drive the Generator. This is the most simple, efficient and economical electric headlight outfit on the market. If you have lamps we can furnish you with the generator for \$25.00. Send for illustrated folder.



The K-W High Tension Magneto

The strongest made for the largest engine made. Positive results and entire satisfaction guaranteed. Give description of engine and ask for price. You can't make an engine too big for the K-W. No batteries needed to start.

WE PREPAY THE EXPRESS all the way on the K-W Master Vibrator and East of the Mississippi River on all our other goods when cash accompanies the order.



Give the
Street Number →
Agents in principal cities.

2835

CHESTER
AVE.

NEW YORK, E. J. Edmond, 1783 Broadway.

CLEVELAND, OHIO. U.S.A.

BOSTON, W. J. Forbes, 248 Columbus Ave.

A AVALANCHE

PARDON THE RHETORIC, but we are a trifle fussed over the tremendous enthusiasm created by the 1914 Maxwell announcement.

A AVALANCHE expresses it exactly.

DEALERS have fallen over themselves to get here first and be among the chosen four thousand who are to cash in on handling the Maxwell line for 1914.

AND ADVICES from our various distributors and dealers tell us buyers have called by hundreds to ask about deliveries.

DELIVERIES — THAT'S ALL — secure in the knowledge that the 1914 Maxwell cars will be the best value, each model in its own class. The experienced motorists who are ambitious to graduate into the Maxwell class ask only one question, "When may I expect my car?"

NUFF SED! "They" are silent since that announcement.

BUSY TRYING to hold their dealers. Too busy to talk about us.

THE DEALER KNOWS he is tying up to the winning line. Are you on yet or only hoping?

MAXWELL MOTOR CO.
DETROIT, MICH.

Any Manufacturer Can Test The Hartford Starter Without Redesigning His Car

With most electric starters the car manufacturer is beset with the difficulty of altering his car's design to try them out.

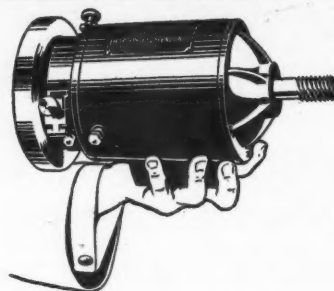
This difficulty has been entirely overcome in the Hartford Electric Starter which can be successfully applied to any car in use without a single structural change. The wonderful compactness of the Hartford Starting and Lighting System makes this practicable.

While our buyers are clamoring for lighter weight cars, they are also demanding electric starter equipment. In the case of many manufacturers this has meant an increase in their car's tonnage, which has produced an under-tired car.

Consequently the demand of manufacturers, designers and engineers is for a starter that is of proven efficiency, yet of extreme light weight.

It remained for Mr. E. V. Hartford, the inventor and designer of the

Hartford Electric Starter



to couple the greatest power with the least weight and offer to manufacturers an electric starting and lighting system which is light, powerful, silent and trouble proof.

No manufacturer is asked to take these claims for granted.

We should be glad to extend you the service of our special installing department which will assign an engineer to attach and demonstrate this system on your car, or you can put it on yourself. Catalog on request.

Send for interesting booklet giving history of Self-Starters

Every Buyer Should Specify the Hartford Starter for His New Car

HARTFORD SUSPENSION COMPANY

EDWARD V. HARTFORD, Pres.

Office and Works: 146 Bay Street, Jersey City, N. J.

Manufacturers of Hartford Electric Starting and Lighting System

BRANCHES

New York—1700 Broadway
New York—212-214 West 88th St.
Boston—319-325 Columbus Ave.
Chicago—1458 Michigan Ave.
Philadelphia—1437 Vine St.
Newark—289 Halsey St.
Jersey City—141-143 Morgan St.
Kansas City—1524 Grand Ave.
Detroit—803 Woodward Ave.
Indianapolis—448 No. Capitol Blvd.

DISTRIBUTORS

Chandler & Lyon
San Francisco
Seattle
Spokane
Los Angeles
Portland
Fresno
Coughlin & Davis, Cincinnati, O.
Reinhart Bros. Co., Inc.
Minneapolis, Minn.
John Millen & Son.
Montreal
Toronto
Winnipeg
Vancouver

When Writing to Advertisers, Please Mention Motor Age.



MOTOR AGE



Published by the
CLASS JOURNAL COMPANY
910 South Michigan Avenue
CHICAGO ILLINOIS

Volume XXIV

AUGUST 21, 1913

No. 8

Contents

| | |
|--|----|
| IN THE FOOTSTEPS OF THE '49'ers..... | 5 |
| First installment of a series descriptive of a trip from Denver to San Francisco over the Midland trail, based on experiences in recent Indiana-Pacific tour | |
| MASSACHUSETTS COUNTS MOTOR EARNINGS..... | 10 |
| More than \$1,000,000 spent in New England states by tourists during past summer | |
| EDITORIAL | 12 |
| EXACT ROUTING OF LINCOLN HIGHWAY UNSETTLED..... | 13 |
| President Joy denies rumors that association already has selected official trail | |
| DODGES DECIDE TO MAKE CARS THEMSELVES..... | 14 |
| Will retire from active connection with Ford and build low-priced model—Other events of interest in motor industry | |
| FRANCE ELATED OVER DELAGE VICTORY..... | 16 |
| Story of how Bablot won at Le Mans and how rival tradesman made it possible for him to land first place | |
| MANY STARS RALLY FOR ELGIN..... | 18 |
| De Palma, Mulford, Grant, Burman, Dawson and the Endicotts among those nominated for Kane county classics | |
| DETROIT CONCERNS JOIN CYCLECAR MOVEMENT..... | 20 |
| Several new companies organized—Results of races at Le Mans, France | |
| MOTOR CAR DEVELOPMENT..... | 24 |
| Description of new Case, Moline and Vulcan | |

DEPARTMENTS

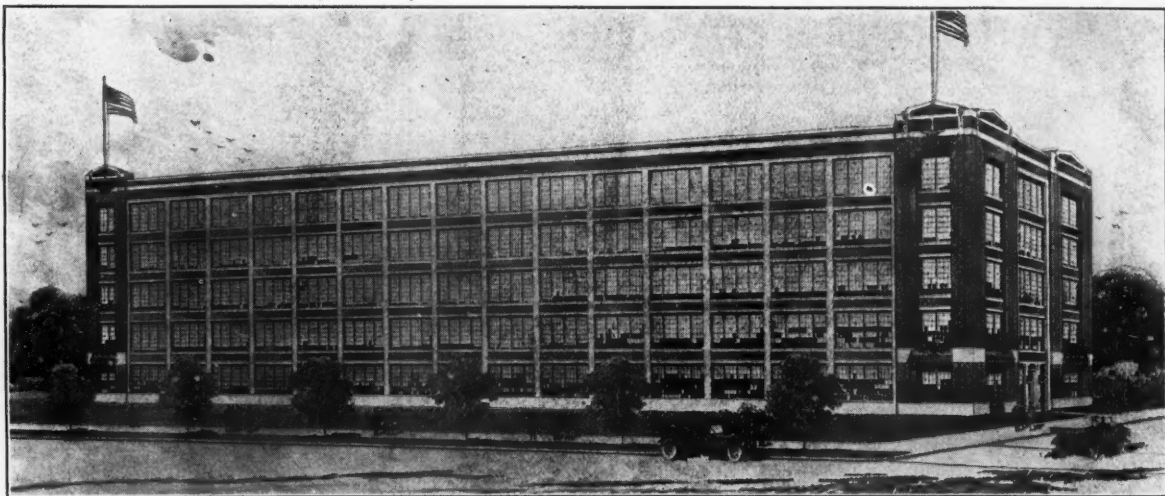
| | | | |
|--------------------------------|----|-------------------------------|----|
| Coming Motor Events..... | 13 | Realm of Commercial Car..... | 36 |
| Routes and Touring Information | | From the Four Winds..... | 38 |
| Department | 22 | Among Makers and Dealers.... | 40 |
| Housing the Motor Car..... | 30 | Recent Incorporations..... | 41 |
| Motor Car Repair Shop..... | 31 | With Accessory Makers..... | 42 |
| Readers' Clearing House..... | 32 | Brief Business Announcements. | 44 |



have met the demand for a high-class indestructible Spark Plug having all those features required by the most careful engineers in the gas engine industry. Bosch Plugs are as good as Bosch Magnetos. They cost but \$1.00 each.

Literature on request.

Bosch Magneto Company
223-225 West 46th St., New York



THIS NEW GRAY & DAVIS FACTORY IS THE LARGEST PLANT OF ITS KIND IN THE WORLD. TOTAL FLOOR SPACE 138,400 SQUARE FEET. MAIN BUILDING IS 380 FEET LONG, 60 FEET WIDE AND 5 STORIES HIGH. WINDOW SPACE OCCUPIES 70% OF THE WALL AREA, PROVIDING MAXIMUM LIGHT AND VENTILATION. A RAILROAD SPUR RUNS DIRECTLY TO THE ENTRANCE OF THE RECEIVING AND SHIPPING ROOMS.

Our New Plant and Its Meaning to You

A Natural Outcome

Seventeen years ago when Gray & Davis began building lamps for automobiles, we little anticipated our present huge volume of business.

But just as oil lighting gave way to gas, gas to the Gray & Davis Dynamo, and the starting crank was edged aside by the powerful 6-volt Gray & Davis Starter, we have been "put to it" to keep pace in furnishing facilities to thoroughly care for our rapidly growing business.

Our need for the finest starting system plant was the natural outcome. And now we have it.

Efficient Manufacture

Here, by the most approved methods we will continue the production of the Gray & Davis Starter and Dynamo. Every device that can increase efficiency, cut time and maintain quality, has been incorporated into our new quarters.

Even in our former quarters we won an enviable record with the 32 automobile manufacturers whom we supply, for unvarying standards in manufacture and quick deliveries.

With our present facilities we are fully equipped to beat our own records.

Prompt Deliveries

In no other industry is the question of prompt deliveries so vitally important as in the automobile business.

The car manufacturer who builds ten, fifteen or fifty thousand cars and has shipments held up because his starters are not delivered on time, is losing sales, friends, prestige, reputation. Buy your starting-lighting systems from the manufacturer having the reputation for delivering in exact accordance with contract specifications, and having the facilities for backing up that reputation. That is the only way to insure prompt shipment of your automobiles.

GRAY & DAVIS, Inc., Boston, Mass.

GRAY & DAVIS

Starting—Lighting System

MOTOR AGE

In the Footsteps of the '49'ers

By Darwin
S. Hatch

Part I



WE called ourselves the Three Migrating Musketeers. Had

Dumas built a story around us and our adventures with a coal oil carbureter, he would have named us the Speed Demon, the Guardian of the Bank Roll and the Inspired Schrivener. Whether we put to shame the swashbuckling deed of Porthos, Athos and Aramis is for you to judge after you have read how we conquered the alkali wastes, the resultant thirst and hazardous mountain ranges on our trip from Denver to San Francisco.

The Three Musketeers

It was early on the morning of July 13, considered by the superstitious an ominous day to start upon a journey, that we left Denver for our cross-country tour to a land of partial disappointments, for we found the Barbary Coast disinfected and Chinatown guaranteed 99 per cent pure. We rode not upon fiery chargers. Swords

This is the first installment of a series descriptive of a trip from Denver to San Francisco over the Midland Trail. The characters are fictitious, but the description of the route is based on observations taken on the Indiana-Pacific tour, which finished at Los Angeles, August 4, and the incidents recounted are founded on the experiences of the Hoosier tourists.

clanked not at our sides. Our mount was a rather light five-passenger motor car, rated at 27 horsepower—25 more than the most pretentious prairie schooner ever had—and driven by the Speed Demon.

Beside the Speed Demon rode the Guardian of the Bank Roll, so called because he carried the diminishing pocketbook and

superintended the compilation of exasperating expense accounts. The inspired Schrivener occupied the tonneau in solitary glory and surrounded by touring impedimenta—a spare can of oil, two rolls of blankets and some 200 pounds of miscellaneous equipment.

In our quest for the Pacific we carried the usual luggage for a trip first attempted by a Spanish gentleman yeleft Balboa. This—the luggage, not the Spanish gentleman—included four canvas water bags, two vacuum bottles, a Compac tent for camping and in a long chest on the running board, a supply of dried meats and canned goods for emergencies caused by mechanical or pecuniary difficulties.

Among our most cherished possessions were a 30-30 rifle, an automatic revolver, a pair of field glasses and a camera. Even the provident Forty-niners were not so well supplied with shooting apparatus as we. Mr. Eastman had not thought of



Owens River Valley above Bishop, Calif., with the Sierras in the distance

the sensitized plate or film when the rush for gold was on 56 years ago.

Unusual Equipment

There were two unusual features of equipment on the car. One of these was the carburetor, which was designed to handle kerosene or distillate, as well as gasoline, so that we would not be dependent on supplies of gasoline in parts of the country where there are few cars. Also the question of economy had a



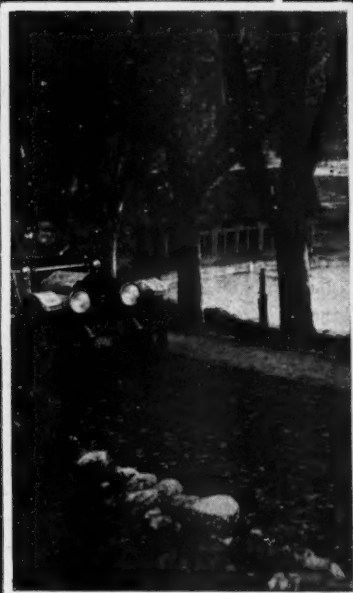
School of Mines. In spite of the altitude, almost 5,500 feet, it must get very warm, for at 10 o'clock the thermometer registered 98 in the shade.

After wiping the perspiration from his tanned face and making a mental survey, the Guardian of the Bank Roll decided that Golden was situated directly over one of Satan's largest blast furnaces or immediately adjacent to a "woman scorned."

Up Mount Vernon Canyon

Golden is right on the eastern edge of the foothills, and upon leaving the town the grade steepened in a winding road called the "hogback" up Mount Vernon canyon. Although the grade averaged over 6 per cent and the roadbed as a rule was very narrow, the highway is of red sandstone and good going in any weather. By the time we were 30 miles on our way we had reached the top of Floyd hill, and the grade, combined with the altitude of 7,700 feet, had the water in the radiator boiling merrily. This was our first, but by no means our last demonstration of the effect of the high altitude in lowering the temperature at which water boils. The motometer on the radiator cap showed only 196 degrees Fahrenheit as the temperature of the boiling water. This is

In Gore Canyon, Colo.



Natural hot pool at Glenwood Springs, Colo.

Among the poplars at Glenwood Springs, Colo.

past Inspiration Point in the suburbs, one of the show places of the city. From here we had a view of 300 miles of the Rocky mountains with Pike's Peak dim in the distance at one end. To our eyes, unaccustomed to the mountains, they seemed to present an impassable barrier, but we pressed westward over a fine gravel road that commenced to climb even before we were out of the city.

For the first 20 miles the road was lined with fruit orchards and between the rows of peach, apple and pear trees, berry-pickers were at work. The first 15-mile run brought us to Golden, a town of 2,500 people and the home of the State

Where gasoline is 60 cents a gallon, Silver Springs, Colo.

bearing as this carburetor permitted us to use the cheaper fuels—quite an item in isolated sections where gasoline costs 60 cents a gallon. Another feature of the equipment was the use of wire wheels and 34 by 6-inch tires. Casings of such a large diameter were used with the idea that they would travel over heavy sand instead of cutting through it. Only 35 pounds air pressure was carried in the tires—a great plenty from our point of view when it came to pumping them up by hand. The combination of wire wheels and large tires with low air pressure made the car unusually easy riding, so that the inferior trails did not prove tiresome. Also we carried a gradometer and a thermometer on the car, both of which proved enlightening.

The Start for the Coast

We left Denver on our transcontinental trip to San Francisco over the Midland trail. Leaving the hotel we headed west



due to the fact that water boils at roughly 2 degrees less than 212, for every 1,000 rise above sea level.

The road up the hill in spots is narrow and winds along the side cliffs so that cautious driving is required in places. Twenty-three miles out of Denver the new road over the top of Lookout mountain joins our route. This was not finished at the time we came through but is expected to be completed before fall. It gives access to Lookout mountain park from Denver and will be a link of the Midland trail.

First Gold in the Rockies

From the top of Floyd hill the road drops with sharp turns. The roadbed is good. It is surfaced with red gravel and the grades have been cut to 7 per cent by means of numerous switchbacks. The sharp turns are well marked with danger signboards and all dangerous and steep sides have been guarded with steel cables strung through heavy timbers. This gives a feeling of security and permits unhampered enjoyment of the wonderful scenery. A very beautiful view of the canyon is presented about 1½ miles from the top of the hill.

From the bottom of the hill we followed a winding and slightly sandy road along

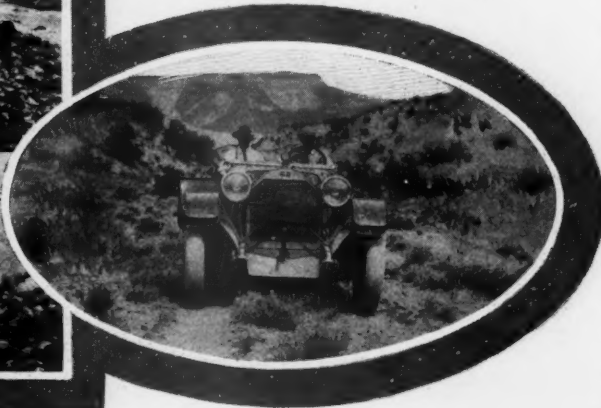
A pass in the heart of the Rockies



Discharge flume of a hydro-electric plant in the Canyon of the Grand

Clear Creek, past the Seaton Mountain Power Co.'s plant where Clear Creek is harnessed to furnish power for the lights and street railways of Denver. Two miles beyond we entered the town of Idaho Springs, a quaint, quiet community of 3,000 people, annually visited by a multitude of tourists. With its natural attractions of a most delightful climate, pure mountain water, entrancing scenery, clear lakes and streams that fairly teem with trout, and unsurpassed mountain drives, it combines such urban advantages as electric lights and steam-heating service. It is at an altitude of 7,500 feet above sea level.

In the mesas of western Colorado



Idaho Springs is located in a valley, surrounded by snowcapped mountains. The town gets its name from the hot mineral springs, which are said to have potent medicinal properties. The curative properties of the hot springs have given the town the name of "The Carlsbad of Colorado." The first discovery of gold in the Rocky mountains was made on the present site of Idaho Springs in 1859. Before that it was the winter quarters of

the Ute tribe of Indians and there are many evidences of their occupancy still to be seen.

After lunch we left Idaho Springs and still headed westward, we again climbed over a good, well-travelled road of white sand and clay formation, still along Clear Creek. Within a distance of 8 miles we passed three small mining camps—Lawson, Dumont and Empire. The latter was once a prosperous town but the boom burst and it is nearly deserted. The one street is lined with rotting and deserted shacks that formed the dance halls and pleasure palaces when gold was plenty. Here we left the valley of Cedar Creek and climbed out over another divide by a winding road up a canyon. The roadbed is of clay and white sand and gravel with no bad turns and no grades over 15 per cent till we reached the east foot of Berthoud pass.

Over the Continental Divide

During the next 3 miles came the real climb to the top of the pass, going up 2,000 feet in that distance. The grade



1—In the Canyon of the Grand near Eagle
2—Palisades along Platte Creek, Colo.

averaged about 15 per cent but there were one or two steep pitches which showed 20 per cent on the gradometer. There were many short turns winding in and out along the heavy timbered mountain sides. The road bed is a good hard clay and gravel formation and no amount of storm or rain can make travel heavy, although the road is very narrow and would be dangerous in wet weather. The last mile to the top of the pass is a trifle rough and rocky.

The many small springs clear and cold as ice, found along the road proved to be a blessing, because it was necessary to refill the radiators and water bags frequently. A car that was essaying the climb ahead of us stuck on one of the steep pitches so that we had to unload and block our wheels to keep from backing down the grade while we pushed the other machine.

After it had gotten a start, we went back to our machine and puffing from the exertion in the thin air, found we had to do some pushing on our own car to get it started. The steep grades were not wholly responsible for this. The rarified air in the high altitudes does not contain sufficient oxygen to thoroughly burn the gasoline or kerosene, so that the mixture is too rich to give more than a fraction of the power attained at lower altitudes.

Mountain Climbing Hints

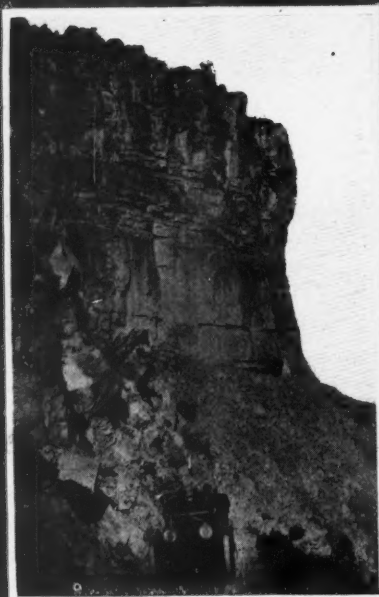
Our experience in climbing this pass and others encountered later brought out several pointers which may be of value to others not familiar with motoring in the mountains. No attempt should be made to motor over Berthoud pass, the summit of which is 11,360 feet above sea level, unless the brakes on the car are in good working condition and the motor is in prime shape. At this elevation the motor requires all the air the carbureter can let in to make a good

mixture and develop pulling power. If the car is fitted with a dash control of the air valve, give the full opening to the air valve but do not change the gasoline feed. If the car is not so equipped, change the air valve adjustment on the carbureter, and allow more air to enter the mixture. Do not cut down the gasoline supply if you have had a perfect mixture at lower levels. If you do you will not have enough pulling force with a light-powered car. If possible, keep from stopping on the pitches, or difficulty will be had in getting under way again.

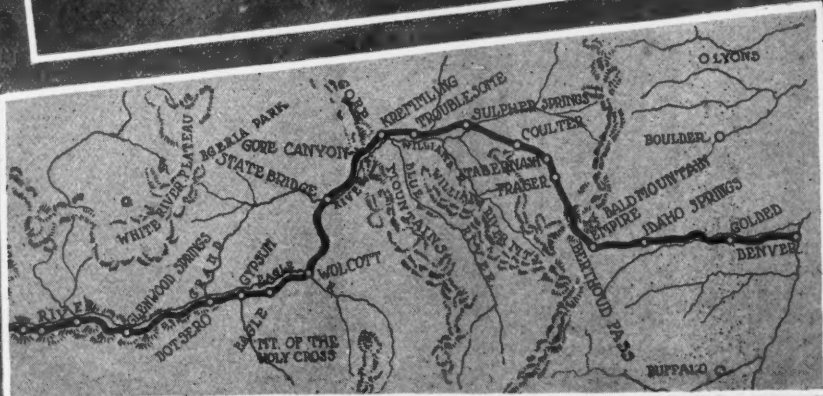
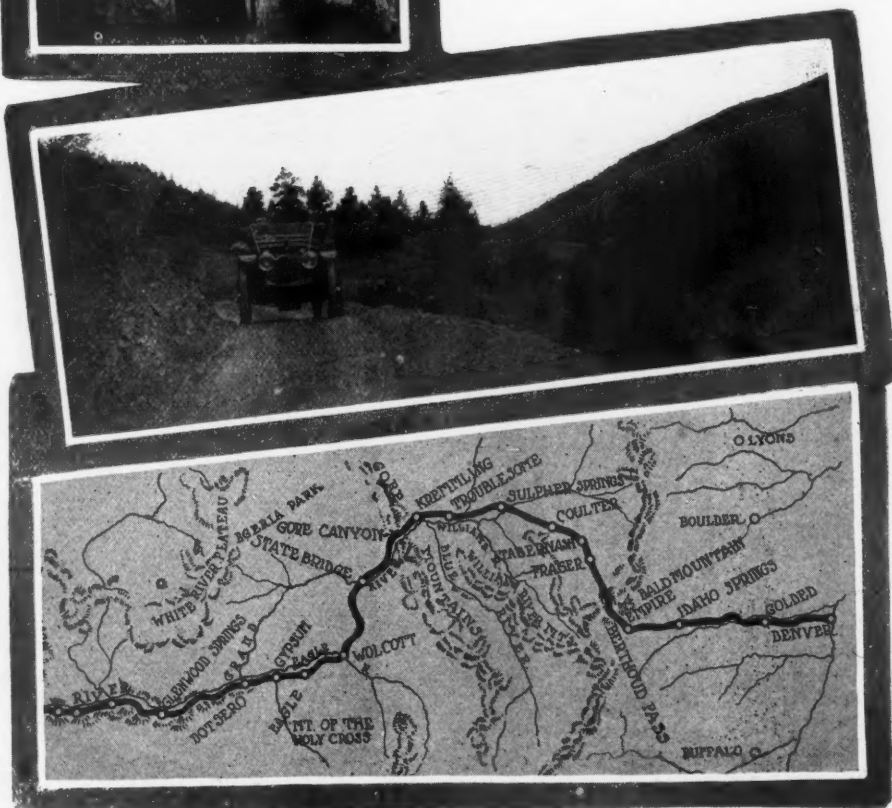
Arrived at the summit of the pass, we found ourselves on a flat table several acres in extent, bare of trees—as we had climbed above the timber line—and banks of perpetual snow on the northern face of the cliffs.

Where Rivers Flow East and West

This is the continental divide, the waters from one side flowing into the Pacific and those from the other finally reaching the Atlantic ocean. The view of the range on range of mountain peaks with their snow caps is wonderful. The ride down the other slope of the pass was less arduous, but required just as careful driving as did the climb. Sharp turns, steep grades, with a cliff on one side and a drop of thousands of feet on the other—the road a mere shelf just wide enough for one car—and an excellent roadbed marked the highway. All that was needed was a steady hand at the wheel and good brakes. All the way down the everchanging vistas of mountain



3—Convict road along the Grand River
4—Route of 2 days' journey through Colorado



and canyon made us all gasp with wonder.

Four miles from the top of the pass we passed Spruce Lodge, a resort in the pines, and another 4 miles brought us to Idlewild, a United States forest reserve station and a sawmill. The Moffat railroad now came into view and the road follows the railroad and the Frazer river down the valley, into Frazer, 69 miles from Denver. This is a growing town and a division point on the Moffat railroad. Gasoline and oil can be obtained at the drug store. Gasoline sold at 30 cents and kerosene at 20 cents.

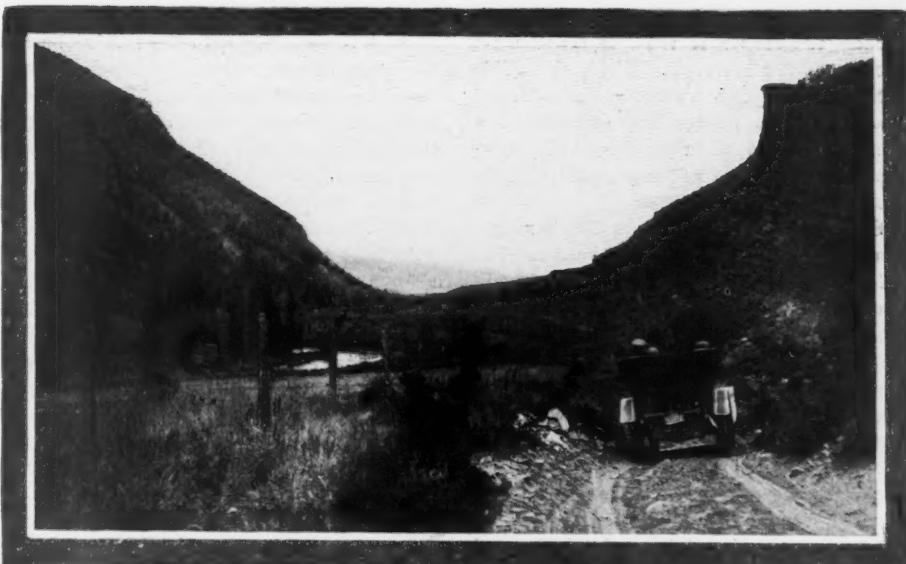
From Frazier we climbed a long winding hill, then went through a pine forest and down again into valley, where we found typical prairie roads, only to climb out again and start the long descent through a narrow canyon.

In Dobe Mud

Emerging from the canyon in a rain-storm, we followed another winding road through a valley around hills of black clay and "dobe" which the rain had made very sticky and slippery. Nine miles of this adhesive driving led us into the town of Sulphur Springs, variously known as "Hot Sulphur" and "Hot Sulphur Springs." The town is at an elevation of 7,650 feet and situated in the center of Middle Park, on the banks of the Grand river and takes its name from a dozen or more hot sulphur springs which boil up through the rock at the edge of town. These springs, though as yet but little developed or improved, are the main attraction. There now is a substantial new concrete swimming pool and a tub-

3—A convict road-building camp in Colorado

4—The road clings to the side of a rocky, sandy hill



1—Typical road and scene in Grand Valley
2—Descending Berthoud Pass in the Rockies

bath house, besides the famous hot pool which is supplied with sulphur water of 117 degrees Fahrenheit. The medicinal properties of the hot springs attract a constantly increasing number of tourists.

We had covered a distance of 92 miles since leaving Denver that morning, and since about half of that distance was up and down and across the backbone of the continent, we considered we had accomplished a good day's work and decided to spend the night at Hot Sulphur. It may be imagined that we enjoyed the hot baths followed by a cold plunge in the pool.

We planned to end the next day's run at Glenwood Springs, 105 miles to the southwest. We started over a naturally good road of sandy loam, very winding and rolling along the Grand river with one or two pitches of 12 per cent. This led into Troublesome, so named from the former difficulty of the canyon.

At the top of a 2-mile rise we started a long descent through a canyon into Kremmling, 18 miles out. Ten miles beyond Kremmling we entered Gore canyon, on what appeared to be a very dangerous cliff road. This offered some of the finest views of the trip. We ran for miles on a hard eyelash road way up the side of a very broad canyon with a river winding like a silver thread a thousand feet below, and across the canyon, some 4 miles away the majestic Rockies reared their snow-topped peaks.

The sight of the Rockies caused the Guardian of the Exchequer to philosophise and make odious comparisons.

"How insignificant is man and how small our bank roll!" he cried in a frenzy of admiration.

The short, sharp downward pitches of 15 and 18 per cent and the very quick turns on the narrow shelf make extreme caution and good brakes necessary.

The little town of Radium is just at the bottom of the descent. It gets its name



from the mines of uraninite or pitchblende, the source of the latest and most precious of all metals. Forty-six miles from Hot Sulphur we crossed the Grand river at State Bridge and commenced a climb over the mesa or highlands, covered with mesquite and sagebrush.

The Gateway of the West

Sixty miles from Hot Sulphur we reached Wolcott where a road branches off through the Red Cliff country southward to Buena Vista. Our road continued westward with excellent road conditions all the way. Shortly after passing Sherwood, a little station on the D. and R. G., the valley narrows with the cliffs almost meeting to form a gigantic gateway to the valley. Bright red soil and brilliant carmine rocks marked the gate and through it the westerling sun appeared like a flame. Almost immediately beyond these rocky portals the valley spreads out into a pleasing farming country to Eagle.

This is on the main line of the D. and R. G. railway, which we found our route followed all the way to Grand Junction. Like most of the points on the route through Colorado, Eagle has magnificent mountain views in almost every direction, each group of mountains varying in its own kind of beauty, some with snow-covered peaks the year round, others covered with green timber and still others of the red sandstone that take on varying hues as the position of the sun changes throughout the day. Potatoes form one of the chief crops of the locality, the yield being given as 300 bushels per acre. Hay and oats are the other agricultural products. The natural resources are the timber and the deposits of gypsum, a quarry of the latter being within the town limits. A short distance to the west of Eagle we found an extinct volcano, with acre upon acre of lava beds.

The Canyon of the Grand

Seven miles beyond, we passed through the town of Gypsum, with its quarries on either hand. Beyond this we crossed the Grand where it is joined by the Eagle river and the road entered the famed Canyon of the Grand. For the entire 15 miles into Glenwood Springs the road is right above the river on a shelf from 50 to 100 feet above the water. It is very narrow and the cliffs rise sheer on one side so that they are within touching distance from the seat of the car. Both the highway on one side of the river and the railroad on the other are cut out of the solid rock or ballasted up along the edge to make a path wide enough for one car. The roadbed is fine and there is no danger about this portion of the trip with careful driving.

Within 10 miles of Glenwood Springs we passed Shoshone bridge and just beyond it the dam and intake gates for the Central Colorado Power Co.'s great hydro-electric plant. At this point the water from the Grand river is taken from the dam and carried through a tunnel

which is 12 feet in diameter and cut through the mountain, to the turbine house $2\frac{1}{2}$ miles below. Here the energy stored up in the water is turned into 16,000 horsepower of electric energy. It is generated at a pressure of 4,000 volts and transformed to 100,000 volts before being sent as far east as Denver and west to Grand Junction.

Arrived at Glenwood Springs we found a town of some 2,000 permanent population and as many more transients situated in a little round valley on the Grand river. It owes its existence as its name to the hot mineral springs, of which there are fifty in the valley, the largest Yampah, alone producing nearly 3,000 gallons a minute. The waters are medicinal, are highly radio-active, and issue from the ground at a temperature of 127 degrees. The swimming pool, the largest outdoor pool in the world, is heated naturally by the hot spring water and covers an acre of ground. In addition to the springs, a potent attraction are the vapor caves. These are small caves on each side of the river in the floors of which springs boil up. The vapor keeps the caves heated to about 112 degrees. Free sulphur deposits on the walls in the form of small crystals.

A monster hotel, of metropolitan appointments has been erected beside the pool to care for the tourists attracted by the springs and the wealth of romantic scenery in the neighborhood. This includes such points as the canyon of the Grand, part of which we had just traversed, Hanging lake, Dead Horse gulch, an extinct volcanic crater at Dotsero, Grizzly and Noname creeks. To the westward lie the state fish hatchery, the elk preserve at Storm King ranch, and Mount Sopris. These all can be reached either by motor or on horseback. There also are several interesting climbing tours, including trips to the Fairy caves, Windy point and Hubbard's caves. We did not take time to see all of these and space forbids description of those we did see, but the names themselves are descriptive. The mountains in the neighborhood are a mecca for hunters and the town consequently is an outfitting point for big game region of Colorado. The Chancellor of the Exchequer, who is a rank conservative, got very wrathful at the six different natives who informed him with much pride that Colonel Roosevelt twice had made the town the headquarters for big-game quests in the mountains.

(To be Continued.)

Massachusetts Counts Motor Earnings

Bay Staters Entertain 20,000 Car Parties

BOSTON, Mass., Aug. 18—That New England is the motorists' paradise is proven by the figures gleaned from the annual crop of registrations of cars owned by non-residents of the Bay state and some figures secured in Maine. Looking over the figures for 1911 it shows that there were about 400 cars registered owned by other than Bay state residents and last year it jumped to 700. For 1913 with the season approaching the end of the registration period for such cars—few of them being registered after the middle of August—the figures total more than 800. In computing these figures to show their real value it must be remembered that these cars are owned by motorists who have planned to stay in the Bay state more than 10 days, the limit of the Massachusetts law for non-residents.

However, for every such car registered it is not an exaggeration to state that there are perhaps twenty-five cars entering and touring through the Massachusetts remaining here 4 or 5 days. This is a conservative estimate. Based on the 800 registered cars that would mean at least 20,000 machines passing through here during the summer owned by non-residents. And averaging say but three people to a car that would mean at least 60,000 motorists for the summer season. Placing the expenses of each one at a low estimate of \$10 each it would represent \$600,000 spent here by these visitors for food and

lodgings. With the other incidentals for gasoline, oil, motor supplies of different kinds it is not a hard task to estimate that our motor visitors alone leave \$1,000,000 here, which is a very good argument in favor of lifting the restrictive clause of 10 days in any one year in our law.

Last year there were twenty-nine states represented in the list. This year there are thirty-one states, and out of all the unregistered thousands it is quite probable that very few of the whole forty-nine states and territories within the borders of the United States were not represented by one or more cars. In making comparisons it is found that while two states represented last year, namely Alabama and Colorado, are missing this year yet there are four new ones, thereby doubling on the missing two, these additions being Delaware, North Carolina, South Carolina and West Virginia. The Pacific coast is represented by California, and while Alabama is out the Gulf of Mexico is represented by Texas, Florida and Louisiana. Last year Honolulu and Brazil were on the list with Cuba, Puerto Rico and Canada, but this year while Cuba and Canada are represented the others are missing, but Great Britain is added, making up in a measure for the loss of far away residents.

The figures for the different states are interesting. New York, with its preponderating list of motorists, and the state

being so near Massachusetts, naturally is the leader. As a matter of fact New York contributes 220 cars, or more than 25 per cent of the whole number.

Territorially grouping the states gives some clearer idea of the visiting motorists, for all but one section shows a gain of some kind. The New England group presents these figures, showing a gain of six:

| NEW ENGLAND | | |
|---------------------|------|------|
| | 1912 | 1913 |
| Maine | 3 | 6 |
| New Hampshire | 12 | 10 |
| Vermont | 2 | 4 |
| Rhode Island | 42 | 42 |
| Connecticut | 43 | 43 |
| Totals | 99 | 105 |

New York being in a class by itself with more than 25 per cent of the total is eliminated from the next group comprising the Atlantic coast states. These states show a gain from 87 to 120, or about 33 per cent, as follows:

| ATLANTIC COAST GROUP | | |
|----------------------|------|------|
| | 1912 | 1913 |
| New Jersey | 56 | 80 |
| Delaware | 0 | 2 |
| Maryland | 17 | 16 |
| Virginia | 5 | 5 |
| North Carolina | 0 | 2 |
| South Carolina | 0 | 2 |
| Georgia | 1 | 2 |
| Florida | 3 | 8 |
| Louisiana | 4 | 3 |
| Totals | 87 | 120 |

There are eight states grouped in the middle west section, and this is the only one of the centers showing a loss. There is a drop of four cars, so that it is more than made up by any one of the other groups. These states and their figures follow:

| MIDDLE WEST GROUP | | |
|-------------------|------|------|
| | 1912 | 1913 |
| Illinois | 39 | 45 |
| Ohio | 46 | 29 |
| Missouri | 40 | 41 |
| Michigan | 15 | 13 |
| Indiana | 7 | 3 |
| Iowa | 2 | 5 |
| Minnesota | 2 | 4 |
| Wisconsin | 1 | 2 |
| Totals | 146 | 142 |

Another group may be arranged by taking the states that are along the border line of the north and south, stretching along to the Mississippi. This group also shows a gain, not much, to be sure, only seven cars, from 88 to 95. But for purposes of comparison it is enough. There are only four states in the group and the figures are as follows:

| BORDER LINE GROUP | | |
|---------------------|------|------|
| | 1912 | 1913 |
| Pennsylvania | 78 | 80 |
| West Virginia | 0 | 1 |
| Kentucky | 4 | 9 |
| Tennessee | 6 | 5 |
| Totals | 88 | 95 |

That leaves but one more group, the states west of the Mississippi river. This group is naturally small owing to the distance the motorists have to get here, but they show a proportionate gain over last year as follows:

| FAR WEST GROUP | | |
|------------------|------|------|
| | 1912 | 1913 |
| Texas | 8 | 10 |
| Kansas | 1 | 9 |
| Nebraska | 4 | 3 |
| California | 7 | 4 |
| Totals | 20 | 26 |

CONTINUANCE IN BIDWELL CASE

Buffalo, N. Y., Aug. 19—The writ of attachment secured by James A. Benture in a libel action against Alfred C. Bidwell,

president of the International Automobile League, has been continued by order of Justice John Woodward. The continuance of the attachment against the money and realty of Bidwell has caused a stipulation to be entered into between counsel for the parties vacating the order of arrest secured by Benture against Bidwell. Their difference grew out of a dispute over the control of affairs here of the Northland Rubber Co.

MARTIN TRACTOR ORGANIZED

Springfield, Mass., Aug. 16—The plans that have been under way for some months to establish a new company to handle the Martin tractor, have been completed and now the company has been formed with a capital stock of \$350,000. The men behind the new company are mostly those who have been identified with the Mayo estate in the Fisk Tire Co. and the Knox Automobile Co., being relatives by marriage with the late Mr. Mayo. Harry G. Fisk, E. O. Sutton and C. E. Beckwith are all identified with the Fisk and Knox factories here. Mr. Fisk is president, Mr. Sutton treasurer and Mr. Beckwith secretary. C. H. Martin, inventor of the tractor, is vice-president and general manager. S. S. Eveland, of Philadelphia, is one of the heaviest stockholders and he is on the board of directors. The plan of the new company is to issue licenses to other companies to make tractors. The Knox Automobile Co., under a previous contract, is empowered to make tractors as in the past. The Martin people have served notice on the trade that they control the patents covering their tractor scheme.

CUTTING SALE DISAPPOINTING

Detroit, Mich., Aug. 19—The postponed public sale of the properties and other assets of the Cutting Motor Car Co. was

held at Jackson, Mich., today. Eight parcels were offered separately and under various combinations and were bid upon by several Cleveland, Chicago and Detroit concerns which make a business of taking over bankrupt stocks. The aggregate bids, however, amounted to only \$18,000 or \$19,000. Following this the property was offered in bulk and the only bid looking toward the continuance of the business was to the amount of \$30,000, made by interests represented by W. M. Thompson, Jackson. The appraised assets of the concern were \$173,155.

Notices of this sale will be sent out to the creditors by the Security Trust Co., of Detroit, which has been conducting the business of the Cutting company for a considerable time. In all probability the trust company will recommend that the sale be not confirmed, that the Thompson bid was an unreasonable figure.

Some time ago a petition was filed by four outside creditors claiming that the Cutting company was bankrupt. This has been answered by a denial of the insolvency and a demand for a jury trial.

FULTON BUYS AERMORE PATENTS

Marshalltown, Ia., Aug. 19—The Fulton Co., of Marshalltown, has purchased the patents on the Aermore exhaust horns from the Aermore Mfg. Co., of Chicago, and will open a manufacturing plant in Marshalltown. The Aermore company will continue the manufacture of its other specialties.

RECEIVER FOR START-LITE

Chicago, Aug. 20—The Imperial Brass Mfg. Co., Chicago, on Saturday last filed a petition forcing the Start-Lite Co., Chicago, manufacturer of engine starters into bankruptcy. On Monday the Central Trust Co. of Illinois was appointed receiver of the defunct concern and possession was taken yesterday.

Plans All Made for Road Congress

Big Program Outlined at Detroit

DETROIT, Mich., Aug. 19—The American Road Congress will hold its third annual sessions in Detroit, commencing September 20. The meetings during the daytime will be held in the convention hall at the Wayne gardens, while evening meetings and special sessions of committees and allied associations will take place at the Hotel Pontchartrain and other hotels. After the usual formalities of registration the congress will be opened by Logan Waller Page, president. There will also be an afternoon meeting on the same day, followed by a garden party in honor of the out-of-town guests.

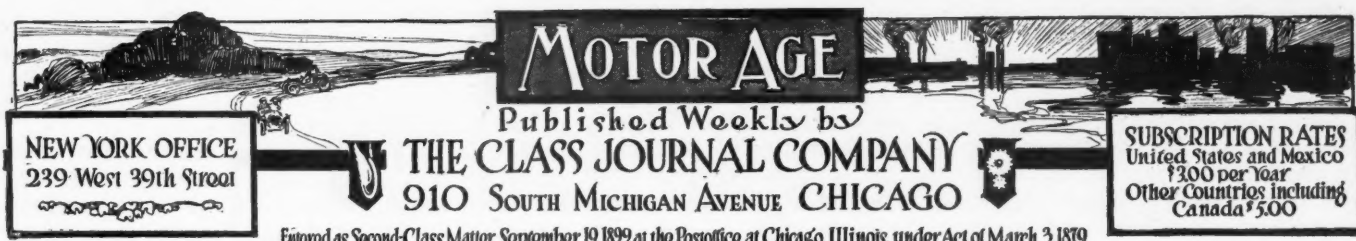
The meetings of the session will be under different classifications and will be in charge of specialized organizations. On Tuesday, the second day, Congressman Frank E. Doremus will be introduced by George C. Diehl chairman of the good

roads board of the A. A. A. At this session attention will be given to national aid and national highways, and to the Lincoln Highway Association.

In the afternoon the American Bar Association will lead the discussion on state legislation and road management. The Wednesday morning session will take up construction and maintenance, under the auspices of the American Highway Association.

The A. A. A. will again conduct the afternoon meeting under the heading of road users' session. The American Bankers' Association will be in charge of the finance session. On Friday Chairman P. T. Colgrove, president of the Michigan State Good Roads Association will preside over a Michigan day.

There will be several banquets and entertainments during the week.



MOTOR AGE
Published Weekly by
THE CLASS JOURNAL COMPANY
910 SOUTH MICHIGAN AVENUE CHICAGO

NEW YORK OFFICE
239 West 39th Street

SUBSCRIPTION RATES
United States and Mexico
\$3.00 per Year
Other Countries including
Canada \$5.00

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

The Power Tire Pump

THE proper extra tire equipment which the tourist sets out with is a topic of foremost importance when the sum total pleasure from the 2 weeks' outing is weighed. It is an oft-heard story. "We did not have any trouble except tires on our entire trip." When the tire situation is analyzed we sometimes get a story of a dozen or more punctures, half of which were pinched tubes and not punctures at all. The trouble in some cases rests with the driver; in many other cases with the repairman. There are hundreds of cases where a repairman has left the flap out of the tire simply because the tire was originally fitted with a permanent one which became torn at the time of the puncture and it was entirely removed. The experienced repairman knows that the permanent or attached flap can be removed readily and the loose flap inserted which will do as well as the attached one. If the flap is left out tube pinching is almost inevitable. Tourists have reported instances of three and sometimes four tubes pinched in succession due to the flap being left out.

IN several cases which have come to our notice where the flaps have been left out the owner was ignorant of it until the trouble was discovered in attempting to make a roadside repair. The trouble was entirely due to either lack of experience or lack of honesty on the part of the repairman failing to give notice of having removed the flap. Some repairmen are so ignorant as not to realize that while a flap may not be necessary on the smallest tire sizes it is imperative on larger sizes.

NUMEROUS tire difficulties suggest the necessity of some form of power tire pump and, in fact, no tourist should start on a trip extending over 5 days without equipping with some form of pump. It is too expensive for the motorist to use the hand pump for inflating large size tires on a vacation trip. Motorists who think otherwise must reckon the cost, which is invariably much more than the mere expenditure of physical energy which in itself is all right. Inflating one large tire with a small hand pump often is sufficient to disturb the mental equanimity of an owner for an entire day. Not infrequently more disastrous results follow in that the overheated driver exposes himself to chills which may result in bodily disorder. The power pump not only solves the difficulty but saves time and insures the tire being inflated to the proper running pressure.

THERE are many car owners who would like a power pump but do not know of a method of installing on their particular make of motor. This question is of such vital importance that manufacturers of motor cars should give attention to the subject in motor design. The power pump is only in its infancy; it will be in universal use in a few years. It is quite absurd to see all the attention devoted to electric lighting, quickly-operated lighting devices for gaslights, electric or pneumatic gear-shift and yet leave the question of tire inflation alone. It is too important to be passed over in this manner.

THE motorist, before starting on his tour, should take the precaution of a greater spare tire supply than ordinarily used. If a single additional spare casing is sufficient for around-home use, then the tour should not be started without two

extra casings. In addition to the two extra casings an extra inner tube or tubes is recommended. Summer touring invariably is in warm weather which is naturally harder on tires than the cooling touring of the spring and fall. Experienced motorists very frequently take the precaution of fitting the rear wheels with new tires before going on a long tour, this being particularly the case if the old tires are more than a year old and may have had an opportunity of deteriorating a little while standing in the garage all winter.

THE owner motorist, if using a standard tire size and also an oversized tire, must remember that he can use the standard size tube in the oversized casing but, on the other hand, he will have difficulty attempting to use the oversized tube in the standard casing. Pinching quite frequently follows the use of the oversized tube in the standard casing.

WHEN carrying extra tubes it is recommended that they be carefully wrapped in heavy paper or carried in the canvas bags furnished by the tire manufacturers. Not infrequently the extra tubes are placed loosely in the space under the rear seat, where they are mixed up with tire pumps and other baggage. This carrying of tubes is the sure road to trouble because they may get punctured before being used.

HALF the enjoyment of touring is immunity from tire troubles and the average owner-driver can, to a certain degree, enjoy this immunity by exercising care in making his preparation. In the first place, he should be sure that his casings are new or comparatively so; that his tubes are either new or carefully vulcanized and that both casings and tubes are properly fitted. Then, with a good power pump and a supply of tire-repairing devices which can be used if occasion demands, he can go on his way confident that he has taken every precaution to sidestep tire troubles. He will find that thus prepared the tour will be more enjoyable for both himself and his party.

Left-Hand Control

THE announcement of 1914 models to date shows vast increases in the number of concerns placing the steering column on the left side of the car. One of the biggest arguments for this is the great amount of city driving. It is particularly difficult with a right side steering when driving on a narrow city street filled with street cars, motor buses and taxicabs. In such driving the left-hand wheel has decided advantages. It is much safer.

FOR country driving it is a debatable point whether right or left positions has the advantage. Experienced drivers, who use cars one day with a wheel on the left side and the next day with it mounted on the right, declare that one is as easily handled as the other. If it is correct to put the steering wheel on the right side in several of the European countries, where the rules of the roads are opposite to those employed in this country, then it is correct with our rules of the road to mount the steering wheel on the left side. In this position it permits of center gearshift and brake levers, thereby permitting of a narrow body effect and the consequent easier task of effecting a transition from the hood to the body, an object receiving considerable attention by present body designers.

Exact Routing of the Lincoln Highway Still Unsettled

President Henry B. Joy Denies Recent Rumors

DETROIT, Mich., Aug. 18—"All reports and rumors to the effect that the route of the Lincoln highway has been finally settled," said President Joy, in a recent interview, "are erroneous and misleading."

"Many sections of the west and middle west, in their enthusiastic desire to see their communities reached by this great transcontinental route, have prematurely announced the selection of this or that road."

"The naming of this great transcontinental route must, in large measure, be governed by the following factors: Points of scenic and historic interest, together with centers of population, which can be advantageously and economically reached, the character and amount of real support rendered to us in making possible this great artery of traffic; all with due regard to the cost of preparing the roadway for the final surface, etc."

"It is evident that the routing of this great transcontinental road must be governed in a measure by its convenience to railroads. From all sections of the middle west there are coming insistent demands that the Lincoln highway pass 'their way.' It is manifest that all of these demands cannot be complied with, and for that reason the factors which I have already enumerated must, to a large extent, govern the directors of the association when they finally choose and announce the route. This highway, when completed, must be of the greatest use to the greatest number during the longest period of each 12 months. It is my belief, and this belief is joined in by many of the directors of our association, that this Lincoln highway will prove the object lesson necessary which will induce the federal government to establish other transcontinental highways."

CONNECTICUT LAW WEAK

Hartford, Conn., Aug. 18—Connecticut is behind other states in some respects as regards the motor law, in the opinion of Max Cohen, chief clerk in the secretary of state's office. He has been visiting the state capitols in New York, Massachusetts and New Jersey which accounts for his conclusions.

"I find that Connecticut is behind New York and New Jersey in two important essentials," he said. "That is in regard to the inspection of the qualifications of applicants for licenses as drivers and the other is in the investigation of accidents. In Connecticut we must rely in case of accidents on the information brought out at hearings at the capitol. In New York, Massachusetts and New Jersey, and I am informed in nearly all of the eastern states as well, they have a system of inspectors, there being one inspector in each county."

When there is an accident in the jurisdiction of the inspector, he makes a visit to the territory and makes a thorough personal investigation of the affair, examining witnesses, and then files his report with the motor vehicle department with the result that a hearing follows.

"Then when it comes to issuance of a license in our state we must take the statement of the applicant as to his age, qualifications, habits and other essentials. In these other states I find that these inspectors investigate every application and give the applicant a practical test as to his qualifications. The applicant is compelled to take the inspector out on the highway and show him that he has the necessary knowledge for the guidance of the car. This is a safeguard against a license to drive getting into unfit hands."

Mr. Cohen is of the opinion that Connecticut must adopt the same system.

WALDON FAVORS CONCRETE ROADS

Detroit, Mich., Aug. 18—"My opinion is," says S. D. Waldon, formerly a member of the good roads committee of the Automobile Chamber of Commerce, "that there should be only two kinds of roads built in the country: concrete and gravel. Concrete is the last word in efficient and durable surface at not too great a cost and gravel the best farmer's road at the minimum expense. I think it is a waste

of time to build roads of anything better than gravel and not as good as concrete."

"Gravel roads cost only a fraction of the cost of macadam roads and the saving that can be effected by building 1 mile of gravel road instead of macadam on the less traveled roads would more than pay the difference in cost of building 1 mile of concrete road instead of macadam," says the publicity bureau of the Automobile Chamber of Commerce.

"In fact, records prove that concrete roads cost not to exceed 50 per cent more than water-bound macadam and about the same as tar macadam. The cost of concrete in Cuyahoga county, O., was \$603.34 for each foot in width 1 mile long as compared with \$577.45 for water-bound macadam and \$885.30 for tar macadam. Those in Wayne county, Mich., cost \$838.03 a foot per mile as compared with \$862.75 for water-bound macadam in Maryland. Experimental road sections laid in Ohio by the state commission cost \$340 a foot for ordinary macadam; \$497.24 to \$651.98 for tar macadam, and \$507 a foot for gravel concrete."

"When properly laid, the concrete road is entirely successful, as is proved by the 65 miles that have been built in Wayne county. The cost of upkeep is almost nothing—less than \$100 last year on the whole 65 miles in Wayne county and not exceeding \$150 in 21 years on 1/2 mile of concrete streets laid in Bellefontaine, O., in 1891-2."

"No patented process or patented materials are required in making concrete roads; they are dustless and mudless, smooth, level, sanitary and self-cleaning, the rains washing the surface. The saving in maintenance alone will in a few years repay the excess of first cost over macadam. All large cities are now using concrete as a base for brick, asphalt, wood block and other street pavements."

"Let the motor car interests unite in demanding permanent roads and urge that particular study be made of concrete as the most suitable material for their construction."

WISCONSIN AFTER CAR SHOW

Milwaukee, Wis., Aug. 18—The first real effort to hold a mid-summer motor show in Milwaukee is being made by the Wisconsin state board of agriculture, which has decided to make a distinct division or department for the motor industry and set aside the mammoth Machinery hall building for a motor show which will be part of the annual Wisconsin state fair, September 8 to 12. Space is being allotted by J. C. McKenzie, secretary, until September 1, after which date the operation will be in charge of Jacob Dietrich, superintendent of machinery.



CONTESTS.

- *August 29-30—Elgin road races, Chicago Automobile Club.
- August 30—September 6—Reliability run, Chicago Motor Club.
- September 9—Corona beach race, Cal.
- September 8-15—Around Lake Michigan tour; Chicago Motor Club.
- September 12—Track meet, Canfield, O.
- September 13—Track race, Grand Rapids, Mich.
- *September 13—Track meet, Covington, Ky.
- September 20-21—Track meet, Detroit, Mich.
- September 21—French light-car road race, Boulogne.
- September 25—Tourist trophy stock-car road race, Isle of Man, Great Britain.
- October 4-11—Chicago Motor Club's Around Lake Michigan reliability.
- November 6—Track meet, Phoenix, Ariz.
- *November 24—Vanderbilt road race at Savannah, Ga.
- †November 27—Savannah grand prix.
- *Sanctioned by A. A. A.
- †Sanctioned by A. C. A.

Shows

- October 15-25—Electric show, Grand Central palace, New York city.
- October 17-27—Paris show.
- October 27-28—Convention Electric Vehicle Association of America, Chicago.
- November 7-15—Olympia show.
- January 3-10—New York show, Grand Central palace.
- January 24-31—Chicago show.
- January 31-February 7—Minneapolis show.

Dodge Brothers Decide to Make Cars Themselves

Will Retire from Active Connection With Ford Company and Build Low-Priced Model—

Other Events of Interest in the Motor Industry

DETROIT, Mich., Aug. 18—An announcement was made Saturday to the effect that the Dodge brothers will retire from their active connection with the Ford Motor Co. and are to enter the motor car field for themselves.

It has been known for some time that the Dodges have built several experimental cars, and about a year ago it was said they had a light six-cylinder model on the road. At that time it was rumored that they wished to build such a car, under their own name, and market it through the Ford agencies, but that the other members of the Ford company did not approve of this plan.

It now is stated that after July 1, 1914, the date on which their present contract for the manufacture of Ford parts will expire, the Dodges will enter the field with a lightweight car of a type similar to the Ford, but possibly selling at a little higher price. It cannot be learned at present whether it will carry a four or a six-cylinder motor.

The history of the phenomenal rise of both the Ford and Dodge companies, and of the fortunes that have been made through them by absolutely clean business methods, is known to almost everyone in Detroit. Twelve years ago Horace E. Dodge and John F. Dodge started a small machine shop in the Boydell building, with a combined capital of about \$700. At that time Henry Ford induced them to make motors and parts for his new horseless machine and to take stock in the company as payment. For some time they made practically the entire car, with the exception of the body and wheels. In the first year they turned out 670 sets of cars, while this past year the number of sets was over 180,000, at a cost of \$10,000,000 to the Ford company.

The Dodges are said to have received \$1,100,000 in dividends from the Ford company this summer, and to value their stock in that company at about \$25,000,000. Although John F. Dodge probably will resign his position as vice-president, when the new product is put out, he states that they will not dispose of their Ford holdings at present.

The Dodge plant is located on Joseph Campau avenue, and for the past 2 years they have been acquiring 2,100 feet of adjacent property on Bismarck street, with this new move in view. Their present plant is one of the largest and most modern in Detroit. A new assembling unit, 900 feet long, will be built at once to give about 20 acres additional floor space.

The plans now call for manufacturing nearly every part of the new car at the Dodge plant, with the exception of the

bodies, which they also expect to build eventually. The change will be equivalent to adding two factories to the Detroit industry, for it is understood that additions are under way at the Ford plant to provide for the manufacture of the parts now being made by the Dodges. Estimates place the additional number of men that will find employment in these two plants at from 8,000 to 20,000. The smaller number probably is a good conservative estimate.

It is stated that the Dodge Bros. is a co-partnership between John F. and Horace E. Dodge, and that there will be no change in this association, neither will the new move have any effect between John Dodge and Henry Couzens, secretary of the Ford company, who make up two of the three members on Detroit's newly formed street railway commission.

GREAT WESTERN CALLS MEETING

Peru, Ind., Aug. 18—A meeting of creditors of the Great Western Automobile Co. has been called for the purpose of arranging for an extension of time. The company, owing to lack of orders during the past few months, is said to find itself in a position where it will be necessary either to secure additional time from its creditors, or discontinue business. A strong effort is being made by the principal creditors to put through a plan by which additional local capital will be secured, and the company put on its feet in good shape.

There is said to be about thirty complete cars and parts sufficient for 100 more on hand, and if time is given to make up and market them funds will be in hand to take care of the greater part of the current liabilities. So far as is known most of the creditors are agreeable to the proposed plan, and it is likely that the production of cars will be continued.

WALPOLE AFFAIRS IN COURT

Boston, Mass., Aug. 16—Judge Dodge in the United States district court here has again put over the question of appointing an additional receiver to work with Robert C. Fisher, recently appointed receiver for the Walpole Tire and Rubber Co. of Waltham, Mass., that figured in financial troubles following the closing of a bank in Providence. The judge had given the creditors an opportunity to select some person to act and there was a meeting last Thursday at New York to go over the case, but it did not produce results.

Attorney Sears, appearing in the interest of some of the stockholders, stated that he had heard that a movement was under

way on the part of a rival tire company to get control of the Walpole company, either to close it down or run it as an adjunct of its own plant. Attorney Metzler, representing the corporation, corroborated Mr. Sears as to these rumors being afloat. Attorney Lee Friedman, in making a report of what Receiver Fischer had been doing during the past week, stated that he had about \$40,000 in cash and had done about \$60,000 worth of business. The question will come up again next Saturday.

STERLING PLANT MOVING

Detroit, Mich., Aug. 18—The Sterling Motor Co., which lately has come under the control of W. C. Little, formerly of the Chevrolet and Little companies, is being moved from Flint into the plant just vacated by the Chevrolet company in Detroit. The move will give the Sterling company about 60,000 clear feet of floor space. When the move is completed, about 500 men will be employed in the manufacture of motors, the same as was carried on by the company in Flint.

Mr. Little announces that they also will take up the manufacture of cyclecar motors, although he is not quite ready to give out definite specifications on these little power plants. It is understood that Mr. Little will be general manager of the company, but that there will be a change in the other officers in the near future.

The Sterling company started shipment of motors from its new Detroit plant today, part of the space having been occupied prior to the removal of the Chevrolet company to Flint.

POPE TUBE MILLS FOR SALE

Hartford, Conn., Aug. 18—Consistent with the recently established policy of conservative operation, the Pope Mfg. Co. has announced the abandonment of offering for sale of the west works, so-called formerly the Pope tube works. The explanation given out is that the recently completed concrete, brick and steel addition to the main plant on Capitol avenue is adequate for all manufacturing demands at this time. The west works have been used for the assembly of motor trucks. All this work will be done in future at the main plant. It was anticipated when the new addition was built that natural growth of the business would result in complete utilization of all floor space. It has been ascertained that the work of assembling the Pope trucks could be more advantageously done at the main than at the isolated plant. The west works were built previous to 1900 in the bicycle days for the manufacture of tubes for Pope

bicycles. The plant eventually passed to the United States Steel Corp. and remained idle for a number of years until it again passed into Pope control.

Sixes exclusively is the manufacturing program announced by the Pope company for 1914. The company announces also that stock on hand purchased for 1914 four-cylinder models will be made into cars and that, the small four which sold in 1913 for \$2,250 will be passed out at \$1,650. The drop in price which amounts to about 26 per cent has caused something of a stir in the local market. That only sixes will be featured is a matter of surprise in view of the acknowledged capability of the big four, which had been the 1913 leader.

EWING OUT OF CANADIAN DEAL

St. Thomas, Ont., Aug. 18—Following an unusually critical meeting of rate-payers when a provisional agreement entered into between the Ewing Motor Truck Co. and the city council here for the removal of the company's motor plant from Findlay, O., to St. Thomas, Ont., in return for the city guaranteeing \$125,000 bonds of the company, E. L. Ewing, head of the concern, sent a communication to Mayor Price of St. Thomas notifying him of the withdrawal of the proposition. A by-law was to have been voted on this week by the rate-payers, some of whom attacked the proposal on the ground that security, consisting of the plant and machinery valued at \$200,000 but which Mr. Ewing admits having bought from receivers for \$75,000, was insufficient. A resolution was passed, with only a few dissenting votes, that the council be asked to withdraw the by-law, but Mr. Ewing's action forestalled the council.

HART-KRAFT SALE POSTPONED

York, Pa., Aug. 16—The plant of the Hart-Kraft Motor Co., North Duke street, was offered at public sale last Wednesday afternoon by the receiver, Donald H. Yost, but was withdrawn owing to the lack of a sufficient bid. It will be offered for sale again on September 9. The sale was conducted by W. S. Owen & Bro., who offered the plant in two lots, one including the real estate and machinery, and the other the personal property. The highest amount offered for the entire plant was \$17,500.

SANDUSKY FIRM IN TROUBLE

Cincinnati O. Aug. 18—The Union Savings Bank and Trust Co. of this city as trustees for the holders of \$150,000 of bonds, has taken possession of the plant and property of the Sandusky Auto Parts and Motor Truck Co. at Sandusky, O. An officer of the local company is now in charge of the affairs of the up-state concern.

According to a statement issued by General Manager Storms, the embarrassment of the Sandusky concern is due to

the recent failure of the Michigan Buggy Co. of Kalamazoo, its largest customer. Property and cash worth altogether about \$150,000 are tied up as the result of the Michigan failure, says Storms, with a capital stock of \$500,000, \$314,000 of which has been paid in. The Sandusky Auto Parts and Motor Truck Co. was incorporated about 3 years ago. The plant with its 200 employees will be kept in operation and a reorganization may be brought about.

MICHIGAN OFFICERS SUED

Grand Rapids, Mich., Aug. 18—Following the appointment of the Detroit Trust Co. as receiver for the Michigan Buggy Co. of Kalamazoo, manufacturer of the Mighty Michigan car, suit has been begun in the United States court here by the Continental and Commercial National Bank of Chicago against M. Henry Lane, Frank B. Lay, and Victor Palmer, officers of the company, for damages not to exceed \$150,000. A second petition in bankruptcy has been filed against the company by the W. T. Richards Co., the Jefferson Park National Bank and Walter F. Lewis, all of Chicago.

NEW SHIELD FOR DETROIT ELECTRIC

Detroit, Mich., Aug. 18—The Anderson Electric Car Co., which makes the Detroit electric, announces the purchase of the entire right to the Hanlon patent for Vacuum car windows. The construction covered by the patent is a glass shield which is hinged at the top of the front window and arranged so that it may be adjusted from the inside of the car. When protection is desired from rain, snow or dust, this glass is tilted down but does not interfere with the driver's view, because his line of vision of the road passes below the lower edge of this glass. If it is desired to have the front of the car entirely open, the protecting window is tilted up entirely out of the way. When brought all the way down, it keeps the regular front window from frosting in winter. The Anderson company has developed a window under this patent which is especially designed for its car, and will equip the 1914 Detroit electrics with it.

MAKERS IN HOSPITAL DEAL

Detroit, Mich., Aug. 19—As an outgrowth of the employers' liability act, which has been in effect in Michigan this past year, and the scarcity of hospital facilities in Detroit eighteen manufacturing concerns here have banded together to form the Manufacturers' Mutual Hospital Association. The association has taken a 5-year lease of the Eaton home-stand, at 484 Jefferson avenue, and is equipping it for hospital purposes. The house will provide for twenty-four beds, doctors' and directors' rooms and operating room and a general reception room. It is said that about \$25,000 a year will be spent in maintaining the institution, which will be ready for the formal opening September 1.

The concerns forming the association are those situated near the river front in the east side factory district. Of those connected with the motor industry, the following names appear: Detroit Screw Works, Morgan & Wright, Ireland & Matthews, Detroit Gear and Machine Co., Michigan Steel Castings Co., King Motor Car Co. and Michigan Bolt and Nut Works. It also is understood that the Chalmers Motor Co. and several other Fairview concerns will join the association in the near future.

SEARCHLIGHT REORGANIZING

Chicago, Aug. 18—The receiver's sale of the assets of the Searchlight Gas Co. was held at Warren, O., on August 14 and the Searchlight Protective Committee purchased the property for \$175,000. As the protective committee represents over 90 per cent of both the Searchlight creditors and the Searchlight stockholders, its purchase of the assets assures the reorganization of the company and the continuance of manufacture, though no plans will be announced for a reorganization until after the court confirms the sale. The committee consists of Charles Minshall, Terre Haute, Ind.; John F. Craddock and John S. Rountree, both of Chicago. H. B. Pearson is the receiver.

INVENTORYING MICHIGAN ASSETS

Detroit, Mich., Aug. 18—The Detroit Trust Co., which is acting as receiver for the Michigan Buggy Co., is progressing with the inventory of the property and expects to be able to make a statement within the next week. It is understood that W. F. McGuire, former vice-president of the Maxwell Motor Co., is spending considerable time in Kalamazoo helping to straighten out the affairs of the makers of the Michigan.

COLUMBUS, IND., AFTER MAIS PLANT

Indianapolis, Ind., Aug. 18—Leading business men of Columbus, Ind., headed by M. O. Reeves, are negotiating for a controlling interest in the Mais Motor Truck Co. now located in Indianapolis. If the deal is consummated the plant will be removed to Columbus, and local parties will have active management of the concern, it is stated.

FORSTER QUILTS MAXWELL JOB

Detroit, Mich., Aug. 18—C. A. Forster has resigned his position as commercial manager of the Maxwell Motor Co., Inc., and it is understood that he will return to the Burroughs Adding Machine Co. Mr. Forster was formerly assistant general manager at the Burroughs factory before he joined Maxwell.

Holton Joins Handley

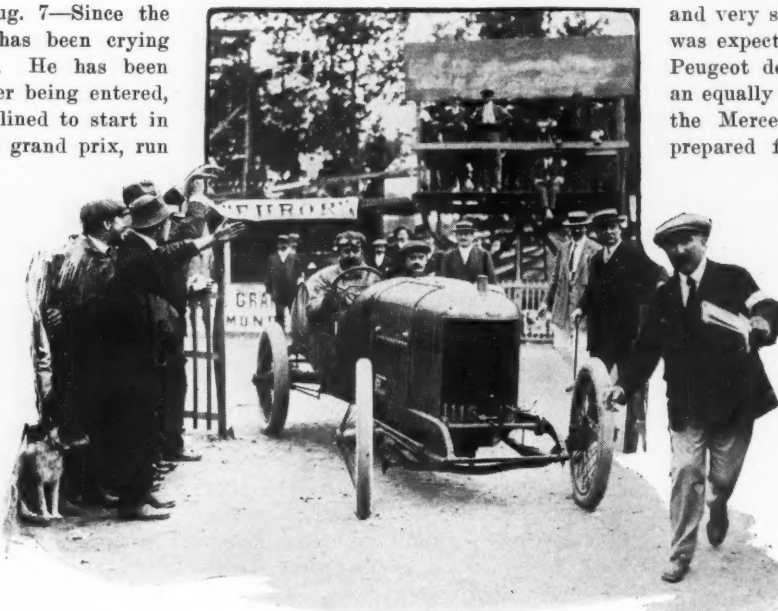
Indianapolis, Ind., Aug. 18—Hoover Holton, who has been sales manager for the Empire Automobile Co., Indianapolis, Ind., since its organization, has resigned to join the forces of the J. I. Handley Co., Indianapolis, and will have active charge of sales of American cars in the states tributary to Kansas City, Missouri.

France Elated Over Delage's Grand Prix Victory

Details of Speed Battle at Le Mans Won by Bablot

LE MANS, France, Aug. 7—Since the grand prix, Delage has been crying for revenge on Peugeot. He has been unable to get it, for, after being entered, the Peugeot company declined to start in the second edition of the grand prix, run at Le Mans. The French light-car specialist, however, has the satisfaction of having defeated the finest foreign cars ever seen in France, and of having set up world's records for long distance road work.

In the keenly contested race just brought to a close, Bablot has won first place for Delage at an average speed of 76.8 miles, and for one lap of the course holds a



BABLOT IN DELAGE, GRAND PRIX WINNER

and very similar in general design, a fight was expected. For an unexplained reason Peugeot declined to run. But there was an equally dangerous set of competitors in the Mercedes team, with cars specially prepared for this race, and not having the disadvantage of having been built under the fuel limitation rules. Lautenschlager and Salzer, two of the best race drivers on the Mercedes staff, had new six-cylinder models of 4 by 5.5 inches bore and stroke; Pilette, the Mercedes agent in Belgium, and one of the most experienced race drivers in Europe, had a four-cylinder model of 5.6 by 5.9 inches bore and stroke; and Elskamp had a four of 5.1 by 6.7 inches bore and stroke. The Delage cars each

GRAND PRIX DE FRANCE, LE MANS. DISTANCE 335.5 MILES

| Driver and car | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------|---------------------|---------|--------------|---------------|--------------|---------|---------|---------|---------|---------|
| Bablot, Delage | Elapsed time. 25:12 | 50:20 | 1:14:50 | 1:39:14 | 2:04:05 | 2:30:07 | 2:56:43 | 3:21:19 | 3:52:32 | 4:21:50 |
| | Position 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Guyot, Delage | Elapsed time. 25:27 | 50:13 | 1:17:23 | 1:43:54 | 2:08:51 | 2:34:09 | 3:07:22 | 3:35:54 | 4:01:19 | 4:26:30 |
| | Position 2 | 1 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |
| Pilette, Mercedes | Elapsed time. 26:33 | 53:04 | 1:19:35 | 1:45:57 | 2:12:09 | 2:38:43 | 3:06:08 | 3:22:27 | 3:59:06 | 4:27:53 |
| | Position 5 | 4 | 4 | 4 | 4 | 3 | 2 | 2 | 3 | 3 |
| Salzer, Mercedes | Elapsed time. 27:57 | 55:46 | 1:23:27 | 1:51:16 | 2:18:34 | 2:45:34 | 3:15:04 | 3:41:43 | 4:08:17 | 4:34:52 |
| | Position 8 | 7 | 7 | 6 | 6 | 5 | 6 | 6 | 5 | 4 |
| Duray, Delage | Elapsed time. 26:18 | 51:48 | 1:17:35 | 1:42:38 | 2:08:12 | 2:48:38 | 3:14:42 | 3:40:12 | 4:10:01 | 4:35:03 |
| | Position 4 | 3 | 3 | 2 | 2 | 4 | 5 | 5 | 6 | 5 |
| Lautenschlager, Mercedes | Elapsed time. 27:16 | 54:37 | 1:21:30 | 1:48:15 | 2:14:57 | 2:41:54 | 3:09:20 | 3:39:18 | 4:07:57 | 4:36:51 |
| | Position 7 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 6 |
| Elskamp, Mercedes | Elapsed time. 28:22 | 59:57 | 1:29:16 | 2:00:21 | 2:40:43 | 3:17:52 | 3:48:12 | 4:19:20 | 5:57:27 | 5:18:45 |
| | Position 10 | 10 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 7 |
| Thomas, Schneider | Elapsed time. 36:58 | 1:03:22 | 1:29:47 | 1:56:07 | 2:25:09 | 2:55:16 | 3:22:22 | 3:48:17 | 4:18:40 | 5:25:55 |
| | Position 14 | 12 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 8 |
| Champoiseau, Schneider | Elapsed time. 52:53 | 1:22:57 | 1:51:36 | 2:21:54 | Broke piston | | | | | |
| | Position 15 | 14 | 11 | 9 | | | | | | |
| Hornsted, Excelsior | Elapsed time. 27:12 | 55:10 | 1:27:15 | Car took fire | | | | | | |
| | Position 6 | 6 | 8 | | | | | | | |
| Gabriel, Schneider | Elapsed time. 31:55 | 57:02 | 1:22:06 | Broke piston | | | | | | |
| | Position 12 | 9 | 6 | | | | | | | |
| Croquet, Schneider | Elapsed time. 27:57 | 55:50 | Broke piston | | | | | | | |
| | Position 8 | 8 | | | | | | | | |

The following retired after two laps: Moraer, Benz, driver tired; Soldateneow, Brasier, car took fire; Christiaens, Excelsior, broken timing gears

world's record at the stupendous average of 85 miles an hour. Albert Guyot, also in a Delage, figures second, less than 5 minutes behind his team mate, and Arthur Duray, after holding second and third places for a long time, brought the third of the Delage cars home into fifth position.

The Delage victory hardly could be more complete. Mercedes put up a most bitter fight, Pilette finally securing third place, with Salzer fourth and Lautenschlager sixth. Elskamp, an amateur Mercedes driver, came in seventh, the Mercedes team, like that of Delage, running the full distance without the loss of a single unit.

This race at Le Mans was intended to be a second edition of the grand prix with the fuel limitation removed. It was expected that Delage and Peugeot would fight it out to the death, and as the two sets of cars are practically the same size



PILETTE IN MERCEDES, THIRD IN LE MANS GRAND PRIX

measured 4 by 7 inches bore and stroke, and were the identical cars having run at Amiens. The Germans had the advantage in size—they were of low weight, not more than 1,900 pounds—and had been prepared and equipped for this race in a manner which was highly creditable to even such a high reputation as that possessed by Mercedes.

The others in the race were a pair of six-cylinder Excelsiors; a full team of Th. Schneiders; a 155-millimeter Benz, which should have been driven by Hemery, but was handled at the last minute by its amateur owner; and the historic Brasier

with which Leon They won the Gordon Bennett cup in 1905. This car had been modernized somewhat and was driven by its amateur owner, a Russian sportsman.

The course at Le Mans is faster than at Amiens, and the distance was only 335½ miles, compared with 569 in the grand prix. Last year's record, established by Goux in the Indianapolis Peugeot, was 72.78 miles an hour.

Bablot set the pace, covering the first lap of about 33½ miles in 25:12, being slightly under 80 miles an hour. Guyot in a Delage and Christiaens in an Excelsior, tied for second place; Duray came

in third, and the first of the Germans was Pilette in a Mercedes. Lautenschlager was seventh, with Croquet right on his heels. On the second lap Christiaens went out with broken timing gears. After four laps three of the Schneiders, driven by Gabriel, Croquet and Champoiseau, had gone out with broken pistons; De Moraes, the amateur driver of the Benz, abandoned with the grumble that there was too much dust on the road; the historic Brasier ran regularly but somewhat slowly until a broken gasoline feed pipe started a fire which destroyed the car. Hornsted's Excelsior also disappeared as the result of a

Balky Motor Nearly Costs Bablot First Place—Saved by Rival Tradesman

WHEN the ninth lap of the second edition of the French grand prix, run at Le Mans, was finished, Bablot had a lead of about 6 minutes on Pilette, and Guyot was about a minute behind the Mercedes. One lap more remained to be run—a distance of 33½ miles—but so close were all the men that it was impossible to predict a single position. Before starting on his last dash, Bablot pulled in to change tires. A front and a rear were taken on.

After a hasty examination it was decided to let the left rear remain, although it was in a rather poor condition. Bablot jumped to his seat and the mechanic to the starting handle. Two, three, four, and five quick pulls were given without any response. Enraged, the mechanic put all his strength into a few more pulls, then staggered against the front wheel utterly exhausted, while the motor remained as silent as the grave.

"Another mechanic."

A man had vaulted over the rails almost before the words had been uttered. He was a slim youth, with more enthusiasm than brawn.

"Get out; you're no good."

He crawled away disconsolately without having touched the machine.

A second man came over, a red-faced, muscular fellow who ought to have no trouble in swinging this balky motor.

"Put some life into it," shouted Delage.

The man put all the life he possessed into those jerks. Again and again and again he tugged the handle up with not a fraction of a second's interval between the pulls. But the motor remained as dead as a mass of pig iron. Half the 5 minutes' lead had been lost in changing tires; second after second had ticked off while the vain attempts were being made to crank the motor. Strong men stood by and clenched their fists in impotent rage. The deadly silence was broken by a woman's shrill piping voice:

"O, I CAN'T stand this."

They hushed her down, but this intensely human cry relieved everybody. Men would have broken the nervous tension by blows or swear words. This woman in the grandstand did it for them in a more gentle manner. Was France to lose the keenest and fastest race of the year because a motor refused to be cranked? It looked like it, for the second mechanic was exhausted and Bablot, with his left arm partially paralyzed, had to sit helpless in his seat.

"I'm on this job."

The words came from an athletic-looking figure as it vaulted over the pit railings. It was Leon Molon, aviator, race driver, car agent, and a few minutes before a competitor at the wheel of a 3-liter car. When his Vinot-Deguingand went out with melted

bearings, he wandered aimlessly into the Delage pit for an idle chat. He was in no way connected with the firm; he was indeed a rival, being agent for a competitive make of car.

There was a second's surprise as this stranger jumped to the front of the car.

"Can we have a third mechanic?"

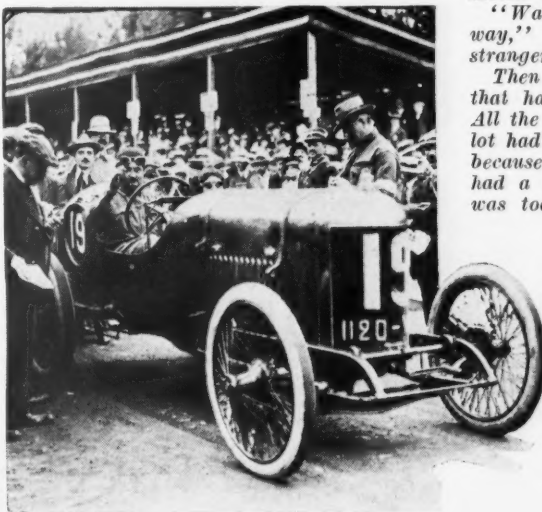
"Yes, but not two at once," was shouted back by a member of the jury.

No more tugging for Molon. He gripped the starting handle and with utter disdain of a backfire spun that stubborn, high-compression motor as if it had been a taxicab power plant. There was an answering roar, followed by a louder roar from the frenzied spectators.

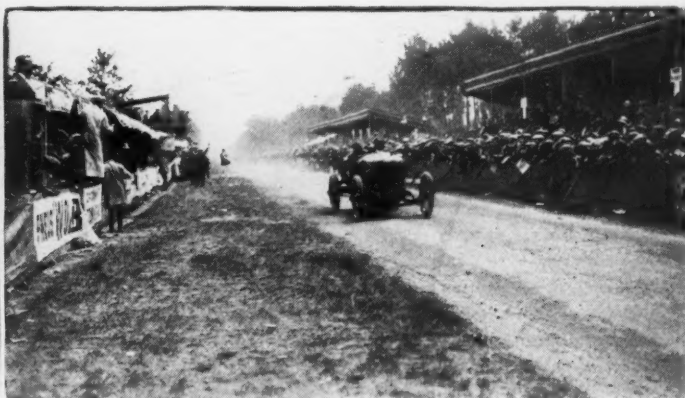
Without goggles, with a happy, self-satisfied grin on his dust and oil-stained face, Molon leaped up beside Bablot.

"Watch that left rear tire; it's in a bad way," yelled Bablot into the ear of his stranger mechanic.

Then they were off for the wildest dash that has ever been seen on any highway. All the lead on Pilette had been lost; Bablot had failed in the grand prix at Amiens because he could not crank his motor; he had a reputation to retrieve, and no risk was too great in this final dash for the grand prix de France. There were three right-angle turns to be negotiated, there was a winding portion of road, there were several cars to be overtaken; there was a certain amount of dust. Bablot was roused; he cared for none of these things. In what appeared an incredibly short time he roared past the grand stands again; he had covered the lap with a standing start at the stupendous average speed of 85 miles an hour, and had saved France from a possible beating by the Germans.



GUYOT IN DELAGE, SECOND



START AND FINISH OF GRAND PRIX AT LE MANS, FRANCE

slight outbreak of fire which put the car out.

The race settled down to a duel between the three Delages and the four Mercedes, for, although Thomas kept going with his Schneider, he never was really dangerous. On the second lap Guyot got ahead of Bablot and set up a record of 80.9 miles an hour for the lap. On the third Bablot went in front and switched the record up to 82 miles an hour. On the fourth Bablot shoved it up to 82.6, and Delage was holding first three places, with Guyot second and Duray third. Mercedes was fourth, fifth and sixth, sufficiently close to be really harassing the French team.

After two laps Guyot had to call for tires. He had blown one at speed and had to make two changes at the pits. Bablot's tire changes came on the fourth lap, and Duray had a similar stop on the same round. Delage was having rather ill luck with his tires. While all three of his cars had called at the pits, none of the Germans had put in. This difference in tire wear was rather surprising in view of the fact that the rival firms were shod by the same manufacturer. Delage had a smaller section, 120 millimeters, at the rear, but he had the advantage of holding to the road very much better than the Germans.

The Mercedes cars were all chain-driven and had tires of 135 section rear and 105 front. Compared with the shaft-driven Delage, they held to the road somewhat indifferently. The report was abroad that the German tire firm has supplied Mercedes with a specially high grade of racing tire and given the Delage the standard article. Naturally there was no possibility of verifying this.

Through stoppages for tires Guyot dropped into third place behind Bablot and Duray on the fifth lap. Then Duray suddenly fell from second to sixth place. His mechanic had over-lubricated; plugs had to be changed, the operation being a rather long one by reason of the mechanic being a stranger to the car; a burst tire and a damaged rim helped further to hold Duray back.

With six laps covered, Bablot was still in the lead, with Guyot second and Pilette's Mercedes hard on his heels. Backing up the first Mercedes were Lautenschlager and Salzer in fourth and fifth positions. Another blowout at speed and Guyot went down one place, putting Pilette second 10 minutes behind Bablot. Delage and Mercedes alternated for the first six places, the positions being Bablot, Pilette, Guyot, Lautenschlager, Duray, Salzer. Nineteen minutes only separated the sixth from the first man.

The fight was the keenest ever seen in a European race. Afraid that Bablot would be overcautious, the Delage pit attendants signaled wrong figures in order to urge him on; the other men were getting every possible ounce of power out of their motors. Pilette held second place for

three laps, Guyot being unable to catch up to him, and the Mercedes being unable to get ahead of the leading Delage. On the sixth lap, while running in fourth place, Lautenschlager had a narrow escape from disaster. At 90 miles an hour he felt that the bonnet was working loose. Before he could make any attempt to slow down the wind got under it and driver and mechanic ducked just in time for it to go flying over their heads and be carried rattling down the road for a hundred yards.

While the pace was at its highest a grand stand incident added a further touch of excitement. Finishing his seventh lap, Bablot prepared to pass Elskamp's Mercedes as it went by the grand stand. The German was occupying the middle of the road and as the Delage was about to dash by he swerved over slightly to the left, making it impossible for Bablot to pass, for the road is not particularly wide at this point. A cry of rage went up from the Delage camp, the spectators echoed it in sympathy, a protest was lodged, and within 5 minutes it was officially announced that Elskamp was fined \$100 for infringement of the racing rules.

In the pits words ran high between French and Germans, the former accusing the latter of systematically holding to the middle of the road and refusing to give way to faster cars. When Bablot came in he denied that Elskamp had sought to hin-

der him in any way. He declared that Elskamp was not at first aware that he was behind him on the grand stand stretch, but as soon as he realized it he pulled to the right and gave a clear course. The incident closed with this statement and the fine was erased.

On the final lap the plucky Pilette had his own troubles. A tire burst and when the change had been made Guyot had slipped into second place. Salzer came in fourth, Duray fifth and Lautenschlager sixth. Chief tester at the Mercedes factory, a hardened driver, Lautenschlager displayed superhuman courage. The narrow escape when he lost his bonnet did not unnerve him. By reason of vibration the spare wheel on the side of his car broke away and was lost on the road. The effort of holding the fast car on the road was so great that when Lautenschlager finished the grind his hands were one big broken blister from wrists to finger tips but the German made light of it.

While the big car race was in progress an uninteresting race for 3-liter cars was being run. After a few laps the brothers Lucien and Leon Molon had to leave their Vinot-Deguingand cars with the white metal run out. Crespelle saw lubrication troubles developing and abandoned. The only man left in the class was Porporato with an old Gregoire modified and tuned up by himself. He covered the distance of 335½ miles at an average speed of 58 miles an hour.

Many Stars Rally for Elgin Road Races

De Palma, Mulford and Grant Among Entrants

CHICAGO, Aug. 19.—Entries to the fourth annual Elgin road races close Friday, but already there are listed enough stars to insure the success of the classics. The list fails to show as many cars as in previous years, but this is accounted for by the fact that this time there are only two races scheduled, as against five last year, and also by the fact that American manufacturers are not very keen over competitions this year.

Still, with such stars as Ralph de Palma, Ralph Mulford, Harry Grant, Joe Dawson, Erwin Bergdoll, Gil Anderson, Willie Haupt, Hughie Hughes, Ed Rickenbacher and Bill Endicott listed, it would seem as if the motor enthusiasts of the middle west ought to get their money's worth Friday and Saturday of next week when the big contests will be staged by the Chicago Automobile Club and the Elgin Automobile Road Racing Association.

There is considerable disappointment over the scratching of the Mercedes entries by E. C. Patterson, the Chicago sportsman, who entered Pilette at Indianapolis. Before Pilette sailed for home he signed up with Patterson and also agreed to bring over Hemery. He cabled soon after that he could not find Hemery and

then, to cap the climax, he sent another cable last week stating that owing to a severe illness he could not come to Elgin. Patterson cabled back to send the car anyway and that he would find a driver, but this message Pilette ignored altogether. Now Patterson is figuring on nominating Mortimer Roberts with the Roberts Special for the first day's race. The entry list stood up to noon today:

FIRST DAY, AUGUST 29

For cars 300 inches and under, 301 miles; for the Chicago Automobile Club trophy, formerly the Cobe cup.

| Car | Driver |
|-------------|-----------------|
| Mason..... | Ralph Mulford |
| Mason..... | E. Rickenbacher |
| Mercer..... | Ralph de Palma |
| Mercer..... | Spencer Wishart |
| Nyberg..... | H. Endicott |
| Deltal..... | Joe Dawson |

SECOND DAY, AUGUST 30

For cars 450 inches and under, 301 miles; for the Elgin National trophy.

| Car | Driver |
|--------------------|-----------------|
| Mason..... | Willie Haupt |
| Mason..... | E. Rickenbacher |
| Isotta..... | Harry Grant |
| Marmon..... | Joe Dawson |
| Mercer..... | Ralph de Palma |
| Mercer..... | Spencer Wishart |
| Stutz..... | Gil Anderson |
| Erwin Special..... | Erwin Bergdoll |
| Tulsa..... | Hughie Hughes |
| Case..... | Bill Endicott |
| Keeton..... | Bob Burman |
| Deltal..... | Not named |

There still are several good prospects. If Mulford is able to get his Peugeot in

shape he is expected to declare for the second day. He is waiting for parts from France. Several local Marmon owners are putting their heads together to put in a Marmon on the first day and have Bruce Keene drive it. A couple of Ohio entries are in sight, while a local Velie owner is figuring on going in. Henry Nyberg also wants to drop in a six-cylinder the second day.

FAST TIME AT LIBERTYVILLE

Chicago, Aug. 17—The second half of the Libertyville dirt track meet, postponed from a week ago because of rain, was run off today before a large crowd. Fast time was made, honors being divided among the Case, Mason and Mercer. The feature was the third and deciding heat of the 10-mile race for 600-inch cars and was remarkable for the bitter fight between Disbrow in the Simplex Zip and Rickenbacher in the Mason. The former won in 9:18½, but Rickenbacher gave him a fight, stirring the crowd to enthusiasm by the manner in which he battled with Disbrow on the turns. On the straights the Zip pulled away, but the Mason driver took the turns without shutting off, making up lost ground there. Summary:

Ten miles, 301 inches and under—C. W. Luttrell, Mercer, won; E. Hearne, Case, second; F. C. Wilbur, Mercer, third. Time, 10:45.

One-mile time trials—L. Disbrow, Simplex Zip, won; time, :53; Rickenbacher, Mason, :54; Bill Endicott, Case, :55; Disbrow, Jay-Eye-See, :56.

Five miles, 450 inches and under—E. Rickenbacher, Mason, won; Chandler, Mason, second; Bill Endicott, Case, third. Time, 5:06½.

Five-mile time trial for state record—Louis Disbrow, Simplex Zip; time, 4:33½; former record, 4:58½.

Australian pursuit race—Bill Endicott, Case, won in 9 miles; time, 9:06½.

Ten miles, cars 600 inches and under; final heat—L. Disbrow, Simplex Zip, won; E. Rickenbacher, Mason, second; Endicott, Case, third. Time, 9:18½.

Five-mile free-for-all—L. Disbrow, Simplex Zip, won; Bill Endicott, Case, second; E. Rickenbacher, Mason, did not finish. Time, 4:53½.

PENN CLUB IN SOCIABILITY

Harrisburg, Pa., Aug. 16—The Elizabeth Automobile Club held a sociability run to Harrisburg last Tuesday. Thirty-two cars were entered in the run. The run covered 133 miles through Dauphin, Schuylkill and Lebanon counties. The motorists had dinner in Harrisburg and supper at Millersburg.

PHILADELPHIA WANTS SPEEDWAY

Philadelphia, Pa., Aug. 16—There is a strong probability that in the near future Philadelphia will have a race track of sufficient size to stage not only weekly contests by local racers but a yearly international meet or two; the latter proposition not being beyond the range of possibilities should present arrangements be carried out, as there is every reason to believe they will be.

With the refusal of the Fairmount park commissioners to reinstate racing in the park and the conversion of the old Point Breeze mile track into an amusement park, there has been no place where a meet could be staged, the consequence being that Philadelphia so far as racing is con-

cerned has been a desert waste, it being over a year since any has been held here. The proposition is being fostered by residents of the Old York road and Bucks county immediately adjoining Philadelphia, in conjunction with a number of Philadelphia motorists. Tentative plans provide for a 2-mile oval speedway to be constructed of either reinforced concrete or brick, 60 feet wide in the straight-aways and 75 feet on the turns, the approximate cost being \$500,000. No definite location has been chosen, but it is likely to be in the vicinity of Willow Grove, a point easily accessible from all parts of this city.

It is proposed to finance the proposition by a series of life-memberships ranging from \$250 to \$2,000, it being expected to secure enough of these to carry it through.

CHICAGO ENTERTAINS ORPHANS

Chicago, Aug. 16—The annual orphans'

Michigan Makes Changes in Laws

Insurance One of Code's Features

LANSING, Mich., Aug. 16—The last Michigan legislature passed a number of acts of vital interest to car owners, some of these now being in effect and some of which are to go into effect on or before January 1, 1914.

Act No. 61 provides for the organization of insurance companies to do a general motor car insurance, and prescribes their powers and duties and regulates the companies. The following provisions of law and any future amendments thereto applicable to the business of life insurance companies in Michigan will apply to and govern the motor car insurance companies doing business by virtue of the act:

Appointment of an attorney to receive process.

Annual statement of financial condition.

Deposit with the state treasurer.

Provisions relative to foreign insurance companies doing business in Michigan, expressly including the payment of specific taxes.

Provisions relative to holding real estate.

Provisions relative to by-laws.

Examination of books and accounts and affairs of the company.

Penalties for false statements or refusals to comply with the orders of the insurance commissioner.

The new registration law will take effect January 1, 1914, although applications for registrations may be made and registration certificates and badges may be issued by the secretary of state at any time within the 60 days immediately preceding the time the act goes into effect. The provisions of the act, as they will be enforced on and after January 1, are as follows:

Every owner of a motor vehicle will be required to file a verified application for registration with the secretary of state.

All registrations expire on December 31 of each year, and may be renewed annually upon payment of the fee originally required and upon the filing of the application, as originally done. The following fees, which exempt the motor vehicle from all other forms of taxation, will be collected:

Motorcycles—Fifty cents per horsepower.

Motor trucks and motor cars—Fifty cents per horsepower.

day outing, this time conducted by the Chicago Garage Owners' Association and the Electric Vehicle Association of America, was held Thursday. More than 2,000 children were given a ride and then there were not enough cars, for it rained in the morning and 100 who had promised cars did not report.

CALLAN ACCIDENT LAW VALID

New York, Aug. 17—That the provision of the Callan law of a driver causing an accident having to give name, address and number before leaving, has been held to be constitutional by a recent decision of the New York court of appeals. The point raised by the defense, that requiring a driver to give such information violated the provision of the state constitution that no person shall be compelled in any criminal case to be a witness against himself, in the case of the People vs. Edward Rosenheimer, was held to be invalid.

Motor vehicles owned or controlled by a manufacturer or dealer, if such person operated upon the public highway not more than five such vehicles—Fifty dollars, and \$10 for every motor vehicle in excess of five so operated.

Nothing in the above section shall be construed as exempting factories, garages, not dealers in motor vehicles, from paying taxes as personal property on motor cars in stock or bond, except on the specified number of machines that have been licensed to operate on the highways.

Manufacturers and dealers, instead of registering each vehicle manufactured or dealt in, may make application for a general distinctive number to cover motor vehicles owned or controlled. On the payment of the registration fee for manufacturers or dealers previously noted, a general distinctive number is issued, together with duplicate number plates, as many as required being allowed upon payment of \$10 for each duplicate in excess of the first five issued with the license.

This does not apply to a motor vehicle operated by a manufacturer or dealer for private use or for hire. For all licenses issued after September 1 half the yearly fee is charged.

The regulations licensing cars owned or controlled by manufacturers or dealers, excepting those in private use or for hire, do not apply to cars operated by a manufacturer or his representative between the factory and any depot, siding or warehouse, dock or other place where it is to be delivered for shipment, or to a warehouse or salesroom, but the person delivering the vehicle must bear an order for the delivery of the car, which shall contain the number of the car, the date and the point at which it is to be delivered. The vehicle also must display on front and rear, upon a card or otherwise, the general distinctive number of the manufacturer or dealer, and must be in charge of a competent driver.

All registrations expire December 31 of each year, and re-registration must be made annually.

The provisions of the act are not applicable to motor vehicles owned by non-residents of the state, providing the owner of the vehicle shall have complied with the laws of his own state, or province of residence, and further providing the state, or province in which he resides, extends similar privileges to motor vehicles registered under the Michigan law. It is also provided that a non-resident owner must conspicuously display his state or province number and that the provisions of the Michigan law must be substantially in force in the state or province of his residence. Such an exemption does not provide for a continuous residence of more than 90 days in this state.

The fees are to be turned over to the state treasurer and applied to the state highway be applied to the building and improving of fund, 5 percent to constitute a fund to be used for salaries and running expenses of the state highway department, the remainder to highways in Michigan.



CONTESTANTS IN RECENT CYCLECAR RACE AT LE MANS, FRANCE—MATHIS, RONTEIX AND VIOLET

Detroit Concerns Join the American Cyclecar Movement

Several New Companies Recently Incorporated

DETROIT, Mich., Aug. 18—Definite news of the activity going on in Detroit in the cyclecar field has been hard to get for the last 2 weeks, due to the fact that every company working on these little cars has been too busy perfecting its plans to have time to give anything out to the public.

Persistent inquiry, however, has disclosed several facts and many rumors on this subject. Probably the most significant point that has been ascertained in covering the whole situation is that the cyclecar development has arrested the attention of men and firms of established reputations in the motor industry here and that they are taking a hand in the work. In three cases it is known that engineers now prominent in the motor world have been retained by new cyclecar companies in an advisory capacity and in two other cases firms of consulting engineers have been commissioned to develop designs and experimental models for well known concerns which do not wish their identities disclosed at present. Although the mention of names has been forbidden in the above instances, a number of new points have come to light as follows:

New Companies Announced

Definite information has just come out concerning the future plans of the American Cyclecar Co., which was incorporated in Michigan early in the year and has since been working very quietly on experimental models. The first cars were designed and built under the supervision of the Herman Engineering Works and have been on the road for some time.

It is now announced that the comparatively small organization which was financing the preliminary work has been absorbed by the Connecticut Electric Mfg. Co. interests of Bridgeport, Conn. The capital stock of the cyclecar company has been increased from \$1,000 to \$200,000, and plans looking to \$500,000 working capital are being made. The officers have been elected as follows: A. H. Trumbull, president; Harry J. Stoops, vice-president; I. B. Trumbull, secretary and treasurer. The Trumbulls are the controlling inter-

est in the Connecticut Electric Mfg. Co. and Mr. Stoops is well known in Detroit as the branch manager of an eastern accessory concern. The cyclecar company will retain the services of K. L. Hermann as engineer, who has developed the new car from the ideas first suggested by Mr. Stoop. Robert R. Adams, formerly purchasing agent of the Interstate Automobile Co. is acting as assistant purchasing agent.

Cars on the Road

The two cars, which have been on the road for several weeks, are equipped with four-cylinder water-cooled motors of 2 $\frac{7}{8}$ -inch bore and 4-inch stroke. They are designed to carry two passengers side by side and plenty of leg room has been provided for. These cars have 80-inch wheelbases and 44-inch treads. When equipped with the lights, a windshield, top and tools, the machines are to sell for \$390.

Aside from the American Cyclecar Co. and the two concerns which have gone to the point of taking factory space, the Princess Cyclecar Co., with a suite of offices located at 1311 Dime Savings Bank building, seems to have perfected its plans about the farthest. It has a two-passenger model which will be its leader, although a four-passenger car and light delivery van will be built upon the same chassis. The whole design has a decided foreign air about it which is not surprising when it is learned that one of the engineers responsible for it is C. J. Thorne-will, who recently came to this country from England, where he was connected with the Wolseley-Sideley and the Thorne-will Bros. companies.

The features of greatest interest about the Little Princess, as the car is called, are the air-cooled motor and the gearless differential. The motor design calls for cylinders cast in block, with the inlet and exhaust manifolds cast integral. A bore of 2 $\frac{1}{2}$ inches and a stroke of 3 $\frac{3}{4}$ inches will give it a piston displacement of 92 cubic inches, or about 1,500 cubic centimeters, which brings it outside of the English cyclecar definition of 1,100 cubic centimeters. The fan is incorporated in

the flywheel. Details of the differential are being guarded, but it is stated that it will not contain the usual bevel and spur gears but will be incorporated in the wheel hubs.

The gearset which has been selected is of the planetary type, with two speeds forward and a reverse, from which the drive will be carried to the rear axle shafts by a shaft and bevel gears. The springing includes semi-elliptics in front and a semi-transverse spring in the rear. Other specifications are: Tubular front axle, two sets of brakes, 28 by 3-inch tires on wire wheels, 44-inch tread and 86-inch wheelbase. The weight will be kept below 620 pounds.

A word can be added concerning the stream-line body design, which will be built of metal. It is planned, however, to make an important change in the use of fenders, following around the curve of the wheels, instead of the tangent type shown. This already is an English practice and will be more in harmony with the other body lines.

It is expected that the first deliveries will be made on February 1, 1914, at a list price of \$375.

Detroit Cyclecar Co. Formed

Probably the latest comer in the field is the concern which is being promoted by A. R. Thomas, whose office is at 510 Free Press building. Although the formation of the company under the name of the Detroit Cyclecar Co. has not been completed, the preliminary designs and complete estimates are out. These call for a four-cylinder motor of 2 $\frac{3}{4}$ -inch bore and 4-inch stroke, which will not only be used for this car but will be manufactured also for the open market, according to the present plans.

Again, a displacement of approximately 95 cubic inches puts the car outside the definition and, in common with all the other so-called cyclecars announced in Detroit, it really belongs to the light-car class, as it is known in Europe. Another feature which departs radically with the popular conception of the cyclecar will be the use of wood wheels.



CONTESTANTS IN RECENT CYCLECAR RACE AT LE MANS, FRANCE—NOEL, SUPER AND BEDELIA

Two body designs have been evolved, both for two passengers only. The one that is expected to be the most popular is along racing car lines, without a cowl and with bucket seats. This will have full fenders, however, and will sell for \$375. The other, which will list at \$475, is of the protected type, with very sweeping stream lines. A very original and pleasing effect is produced by a radiator whose lines converge at a blunt point in the center, in which the headlight is incorporated.

Some Characteristics

The more orthodox features of the design are a two-speed forward and reverse gearset, shaft drive, 48-inch tread and 92-inch wheelbase. The weight is estimated at 700 pounds.

About a week ago it became known in real estate circles that the American Voi-

turette Co. has leased the former Brush runabout plant at Euclid avenue and the Grand Trunk Railroad from the Maxwell Motor Co. Since taking possession, men have been busy on a job similar to one of the famous tasks assigned to Hercules, for the plant has been vacant for some time. The work of clearing and repairing is now completed and everything is ready for installing the machinery. Shipments of axles have arrived and other parts are on the way which will be made up at once into agents' demonstrating cars.

W. C. Little, who has severed his active connection with the Chevrolet Motor Co. to take control of the Sterling Motor Co., states that he is going to be among the first in this country to manufacture small motors for the cyclecar market. Mr. Little, however, is not ready as yet to announce the details of the new product

other than that it will be of the four-cylinder, water-cooled type. The Sterling plant at Flint is being removed to Detroit, where its regular line will also be continued as well.

Ford Denies Rumors

Concerning the Ford company, a new rumor has floated in from Ohio. The story says that Mr. Ford will put out a new car, distinct from his present output, to sell at \$350, the intention being to block the cyclecar movement by an extremely light car of standard design. No credit is given to this, in Detroit, and Mr. Hawkins' office brands it as "absolutely ridiculous" along with the hundreds of other rumors of the "three cars for \$1,000" species. The report is noteworthy, however, as indicating the interest throughout the entire country in the cyclecar development.

France Runs Another Cyclecar Race, Violet Winning

PARIS, Aug. 7—Violet in a twin-cylinder Violet-Bogey won the second cyclecar race in France run in connection with the Le Mans meeting. With a machine complying with all the official requirements as to cylinder area and weight, he covered the distance of 168 miles in 3 hours 38 minutes 54 seconds, being at the very satisfactory average of 46 miles an hour. Very close second place was secured by the little four-cylinder watercooled Baby Peugeot; Ronteix came third, and Baby Peugeot fourth and fifth.

In addition to this class, provision was made for machines not exceeding the 67.15 cubic inches cylinder capacity allowed under the cyclecar definition, but having

no weight limit. In this class the winner was Muraour in a four-cylinder water-cooled Ronteix. His time for the 168 miles was 3 hours 37 minutes 25 seconds. Mathis, in a cyclecar built entirely on car lines, was second in 3:54:38, and Heck in a Fif, also a car type, came third.

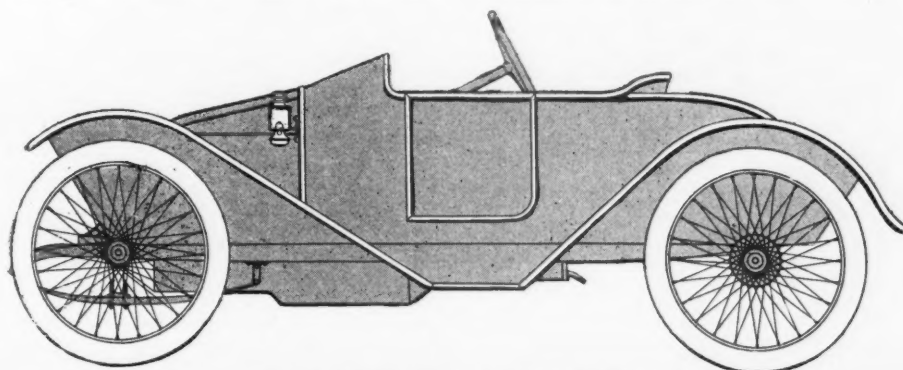
On the suggestion of Charles Faroux the start of the race was made on the open road in the same way as at the Indianapolis 500-mile race, there being ten cyclecars in the first group and seven in the second batch without weight limit. The experiment proved decidedly successful, the scene at the start being interesting and the race simplified, for there were no calculations to make and the first man

over the line naturally was the winner.

Very few failures had to be recorded. Simon in an Automobilette, broke a rear spring when going over a bump on the road. As the result of this the car turned over and was wrecked, the driver and passenger being uninjured. Ducruzel, in the second Automobilette noticed that the wire cables of his steering gear were chafing and rather than risk an accident withdrew. This firm has now decided to employ direct steering in place of cables. The Singer, the only English machine in the race, went out at an early stage with engine trouble. Bourbeau was held up on the first lap with three punctures. His Bedelia was run fast and regularly on the following laps, but the leaders had set such a pace that it was impossible to close up on them.

Violet got the lead on the first lap, held it on the second and third, and lost it to the Baby Peugeot on the fourth, and regained it during the dash home over the last ten miles of the course. Summary:

| CYCLECAR CLASS | | |
|--------------------------------|-----------------------|---------|
| Pos. | Driver and Car | Time |
| 1 | Violet, Violet-Bogey | 3:38:54 |
| 2 | Bas, Baby-Peugeot | 3:39:32 |
| 3 | Jolibois, Ronteix | 3:43:50 |
| 4 | Chichon, Baby-Peugeot | 3:45:56 |
| 5 | Blanc, Baby-Peugeot | 3:50:53 |
| 6 | Leveque, Super | 4:05:09 |
| 7 | Noel, Noel | 4:26:08 |
| 8 | Bourbeau, Bedelia | 4:39:11 |
| CYCLECARS WITHOUT WEIGHT LIMIT | | |
| 1 | Muraour, Ronteix | 3:37:25 |
| 2 | Mathis, Mathis | 3:54:38 |
| 3 | Heck, Fif | 4:35:47 |



PRINCESS CYCLECAR, MADE IN DETROIT

Routes and Touring Information

Answers to Route Inquiries From Motor Age Readers

Omaha, Neb.-Chattanooga, Tenn.

GORDON, Neb.—Editor Motor Age—I am figuring on a motor car trip from here to Chattanooga, to start in a couple of weeks and would like to have Motor Age advise me as to the best route to take. I know the route from here to Omaha already and would like to have outlined for me the best route from Omaha on, and also advise me where I can secure detailed information as to maps, routes, etc. Our idea is that we want to go to Indianapolis and then south from there if the good roads will take us that way.—E. C. Swigert.

Your best route east from Omaha will be over the Blue Grass trail to Creston, 111 m., via Council Bluffs, Glenwood, Hastings, Red Oak, Staunton, Villisca, Corning; Creston to Ottumwa, 116 m., via Afton, Murray, Osceola, Woodburn, Chariton, Russell, Melrose, Albia; Ottumwa to Burlington, 78 m., via Fairfield, Rome, Mt. Pleasant, New London, Middletown; Burlington to Galesburg, 50 m., via Oquagua, Monmouth; Galesburg to Peoria, 54 m., via Maquon, Farmington; Peoria to Bloomington, 43 m., via Tremont, Lilly, Danvers; Bloomington to Champaign, 51 m., via LeRoy, Farmer City, Mahomet; Champaign to Indianapolis, 128 m., via Homer, Danville, Covington, Veedersburg, Crawfordsville, Jamestown, Brownsburg. For the remaining portion of your route refer to routing from Indianapolis to Chattanooga, published in Motor Age issue of July 31.

Volumes 4 and 5 of the Blue Book will give you complete running directions and maps covering this route. They may be obtained from the Automobile Blue Book Pub. Co., Karpen Bldg., Chicago, and cost \$2.50 each.

Joliet, Ill.-Dyer, Ind.

Big Rock, Ill.—Editor Motor Age—I am planning a trip from here to Monticello, Ind., by way of Aurora, Joliet, and then across to Dyer, Ind. In the Blue Book is given all of the route except from Joliet, Ill., to Dyer, Ind. Can Motor Age advise me of this route, and are the roads good this way, or would it be better to go by way of Chicago?—Arlie Jones.

It will not be necessary for you to run into Chicago unless you wish to as there is a good road leading direct from Joliet to Dyer which will take you through Cherry Hill, Gaugers, New Lenox, Frankfort and Richton. The 1913 edition of the Blue Book gives this road; your copy must be of an earlier edition.

South Whitley, Ind.-Ithaca, Mich.

South Whitley, Ind.—Editor Motor Age—I would like to know the best route to take in traveling from South Whitley to Ithaca, Mich.; also the distance.—Omer R. Metz.

From South Whitley go to Ft. Wayne, then north 97 m., to Kalamazoo, Mich., via Swan, Kendallville, Valentine, LaGrange, Sturgis, Mendon, Vicksburg; Kalamazoo to Ithaca, 112 m., via Galesburg, Battle Creek, Bellevue, Charlotte, Lansing, DeWitte, St. Johns, Bridgeville and Pompell.

Cincinnati, O.-Cairo, Ill.

Delhi, O.—Editor Motor Age—I wish to make a trip to Cairo, Ill., preferably via Aurora, Vincennes, Ind., and Salem, Ill. Is this as good a route as any? Are there any bridges over the various branches of the White river and the Embarras? The Miami can now be crossed at Miamitown and in a few weeks the temporary bridge at Cleves will be ready. The Whitewater at present is crossed by ferry at Harrison, but the suspension bridge near Elizabethtown is nearly ready for traffic.—C. B. Harris.

On your direct route as you have outlined it you will strike some poor road, in addition to the sections you mention, affected by the floods. Motor Age has received information agreeing with yours relative to opening of the various bridges that were destroyed on the route you would want to follow from Cincinnati west.

Your direct route is Cincinnati to Seymour, Ind., 93 m., via Lawrenceburg, Aurora, Dabney and Nebraska; Seymour to Paoli, 57 m., via Brownstown and Salem. From Paoli you can go into French Lick, if you desire, or almost straight west for Vincennes, 60 m., via Loogootee, Canalburg and Washington.

The first part of this route coincides with the route to French Lick and is good gravel.

From there on, however, to Loogootee, for a distance of about 18 m., the road is not much travelled by motor cars, is quite hilly and in some spots rough, although very scenic. From Loogootee to Vincennes the road is good.

Vincennes to Salem is 80 m., via Lawrenceville, Olney and Flora. From Lawrenceburg on you follow a natural dirt road which has not received a great deal of improvement, although fairly good in summer months if you do not encounter heavy rains. From Salem south to Cairo you will find even less motor travel, but we think you will have no serious difficulty on the following route:

Go to Mt. Vernon, 23 m., passing through Dix, then to Benton, 27 m., via Bonnie and Ina; from Benton to Marion 23 m., via West Frankfort and Johnson City; Marion to Vienna, 27 m., via Hudgens and Goreville. From there to Cairo 45 m., via Grand Chain, Olmstead and Mound City.

Oklahoma City, Okla.-Portland, Ore.

Broken Bow, Neb.—Editor Motor Age—Kindly advise me as to the best route by car from Oklahoma City to Portland, Ore., via Denver, starting December 1. How will the weather conditions be at that time of the year, and if that will be too early in the winter, when would be the best time to start in order to find the road in the best condition; also where would we encounter the worst roads; what is the distance; and what would be the accommodations needed on such a route?—Archie H. Tibbits.

It would be quite impossible for you to make the trip you have planned, leaving Oklahoma City December 1. September 1 is the latest date at which you should consider making the start, and the middle of August would be much better, as by the middle of September the high mountain passes are liable to be choked with snow. Nor could it be negotiated late in the winter, as the passes would not be cleared of snow before April at the earliest, and the early spring travel among the mountains would not be pleasant on account of damage done to the roads by spring freshets. Therefore Motor Age suggests that the southern route is the only feasible one for winter and early spring travel.

In the issue of July 10, pages 24 and 25, is given an account of a trip from New Mexico to Oklahoma City and return, which will give you routing to Roswell, N. M. Continuing the Borderland route will take you through Alamogordo, El Paso, Deming, Lordsburg, Douglas, Tucson, Phoenix, Yuma, Brawley, El Centro, San Diego. From this point north you will follow the Pacific highway via Santa Barbara, Paso Robles, Santa Cruz, San Francisco, Sacramento, Chico, Montague, Medford, Eugene, Salem to Portland, making a trip of about 3,825 miles.

Anyone contemplating such a tour will find the article, "Picking and Packing for a Long Tour," by Darwin S. Hatch, who accompanied the Hoosiers on their recent trip to the coast, of great value in making preparations for such a journey by motor car. This article will be found on pages 20 to 23 of August 14 issue of Motor Age. Of course, a natural part of the equipment is volume 5 of the Blue Book, which covers the territory west of the Mississippi river.

O'Neill, Neb.-Hancock, Minn.

Inez, Neb.—Editor Motor Age—Please give me the routing from O'Neill, Neb., to Hancock, Minn.—E. A. White.

From O'Neill you are probably familiar with the road through Emporia, Orchard, Plainview, Osmond, Wausa and Crofton to Yankton; from Yankton to Sioux Falls is via Freeman, Bridgewater, turning at this point from the Meridian road onto the South Dakota Scenic highway and passing through Canistota; Sioux Falls to Brookings via Dell Rapids; Brookings to Ortonville via Altamont, Milbank; Ortonville to Hancock via Appleton and Benson.

Tonopah, Nev.-Ray, Ariz.

Ray, Ariz.—Editor Motor Age—Please give me the shortest routing from Tonopah, Nev., to this camp by way of Phoenix, Ariz. Is it necessary to go through Los Angeles?—Merrill Knapp.

There is no shorter way from Tonopah to

Ray than the regular route through Los Angeles, then via San Diego, El Centro, Brawley, Yuma, Palomas, Phoenix and Florence.

Mineral Wells, Tex.-Warrensburg, Mo.

Mineral Wells, Tex.—Editor Motor Age—Please publish the best motor car route from Mineral Wells to Warrensburg, Mo.—R. A. Peak.

You are, of course, familiar with the conditions of the road leading to Wichita Falls via Jacksboro, and that on account of some of the counties not having kept it in good repair Ft. Worth-Oklahoma travel has been turned through Bowle. From Wichita Falls north to El Reno, 174 m., is via Burkburnett and toll bridge across the Red river, Randlett, Lawton, Chickasha; El Reno to Wichita, Kan., 184 m., via Dover, Enid, Medford, Caldwell, Wellington. At Newton, 25 miles north, the Santa Fe trail makes a good road for your travel to Kansas City, passing through Peabody, Florence, Clements, Elmdale, Cottonwood Falls, making the run to Emporia, 108 m.; Emporia to Kansas City, 134 m., via Waverly, Williamsburg, Ottawa, Edgerton, Olathe, Martin City; finishing the trip via Independence and Pleasant Hill.

Four States Run

Jacksonville, Ill.—Editor Motor Age—Kindly publish the best route to Kokomo, Ind.; Chicago, Berlin, Wis., Des Moines and back home. From Berlin to Des Moines I want the scenic route along the river.—G. B. Andre.

A run of 33 miles will take you to Springfield, then 103 m. to Champaign through New Buffalo, Decatur, Maroa and Monticello; 93 m. to Lafayette, through Urbana, Danville, Covington, Attica, and Elston; and 45 m. to Kokomo via Middlefork and Burlington. The Chicago run is outlined in the Logansport, Ind., inquiry, but will have to be followed in the opposite direction.

A fast road to Milwaukee is that through Niles, Wheeling, Half Day, Libertyville, Truesdell, Corliss and Franksville.

The directions from Milwaukee as far as Oshkosh are given in the Milwaukee inquiry and a run of 32 m. will lead through Waukau to Berlin.

Green Lake, Ripon, Brandon, Waupun, Beaver Dam, Columbus and Sun Prairie will find you in Madison, from which city you head toward the river via Pine Bluff, Mt. Horeb, Ridgeway, Dodgeville, Mineral Point, Calamine, Platteville, Cuba, to Dubuque. The river road between Dubuque and Davenport is Lamotte, Fulton, Maquoketa, Charlotte, Lyons, Clinton, Princeton and Pleasant Valley.

A road from Davenport to Des Moines can be followed 187 miles through Durant, West Liberty, Iowa City, Homestead, Marengo, Grinnell, Kellogg, Newton, Colfax and Mitchellville.

The return run can be made through Prairie City, Monroe, Otley, Pella, Oskaloosa, Cedar, Freemont, Ottumwa, Agency, Stockport, Hillsboro, Houghton, Denmark, Ft. Madison, Hamilton, Sutter, Lima, Marcelline, Ursa, Quincy, Fowler, Tinewell, Rushville, Frederick, Beardstown, Bluff Springs, Virginia and Arcadia.

Ft. Dodge to Oklahoma

Houston, Tex.—Editor Motor Age—Please give me a route from Ft. Dodge, Ia., to Oklahoma City, Okla. I wish to start about September 1.—C. W. Lindsay.

Route to Des Moines, which is a run of 92 m. through Dayton, Ogden, Boone, Madrid and Polk City, then go on south through Iowa and Missouri on the Mt. Ayr highway, which runs through Booneville, Winterset, Afton, Tingley, Mt. Ayr, Redding, Grant City, Gentry, Stanberry, Rochester and St. Joseph, a connection with the Santa Fe trail can be made by following through Wathena, Blair, Troy, Manning, Highland, Hiawatha, Horton, Holton, Mayetta, Hoyt, Topeka, Scranton, Burlingame, Osage City, Reading and Emporia, traveling on it through Strong, Florence, Peabody, Walton and Newton, thence heading south on the road which passes through Wichita, Mulvane, Winfield, Arkansas City, Newkirk, Ponca City, Perry, Orlando, Guthrie and Oklahoma City.

It is also possible to run from Wichita

through Wellington, South Haven, Blackwell, Perry, etc., to Oklahoma City.

A Blue Book 5 will furnish you with complete running directions.

Tuscola, Ill.-Baroda, Mich.

Tuscola, Ill.—Editor Motor Age—Please give the best route and the kind and condition of roads to Baroda, Mich.—Edw. M. Kerns.

From Champaign go to Danville 40 m., via Homer; Danville to Crown Point, 114 m., via Alvin, Hoopston, Kentland, Thayer; Crown Point to La Porte, 43 m., via Merrillville, Valparaiso, Westville; La Porte to Baroda, 106 m., via Hudson, Gallen, Hill's Corners. This road is mostly macadam or gravel, some sand, but is the best road.

Milwaukee to Appleton

Milwaukee, Wis.—Editor Motor Age—I would like a route from Milwaukee to Appleton, Wis., giving detailed land marks along the way, and total distances traveled at various points along the route and the total distance.—J. A. Kiss.

It is impossible to give the directions as you desire, owing to the pressing demands for space in this department. However, the total distance of the run from Milwaukee to Appleton is 193 m., going via Menominee Falls, Mecker, Richfield, Schleisngerville, Addison, Byron, Fond du Lac, Van Dyne, Oshkosh, Neenah and Appleton. For such information as you desire it would be advisable to secure a Blue Book 4.

Montana to Wichita, Kan.

Billings, Mont.—Editor Motor Age—I am figuring on making a trip to Wichita, Kan., in my car. What is the best route by way of Denver, starting about the middle of September?—F. E. Williams.

Your route will lie to Rapid City, S. D., then south through Julesburg, Colo., to Denver, on south to Pueblo and east over the Santa Fe trail to Wichita.

It is not wise for a single car to travel through the country through which you will pass on the way to Rapid City, which is via Sheridan, Gillette, Sundance, Spearfish, Deadwood and Sturgis. It is 290 m. to Julesburg, running through Hermosa, Fairburn, Hot Springs, Alliance, Broadwater, Sidney and Chappell; 210 m. to Denver, which is Sedgewick, Proctor, Sterling, Fort Morgan, Bennett and Watkins. Routing toward Pueblo the run takes you through Sedalia, Palmer Lake, Monument, Colorado Springs, Fountain, Buttes and Bragdon.

Following over the Santa Fe trail your road lies through Manzanola, Rocky Ford, Swink, La Junta, Las Animas, Prowers, Lamar, Granada, Holly, Syracuse, Kendall, Garden City, Ingalls, Cimarron, Dodge City, Kinsley, Great Bend, Ellinwood, Chase, Lyons, Sterling, Nickerson, Hutchinson, Elmer, Haven, Mt. Hope and Colwich.

From Deadwood to your destination you will be able to secure route directions in the volume 5 Blue Book.

Chicago to Richmond, Ind.

Logansport, Ind.—Editor Motor Age—I would like to have a routing from Chicago to Logansport via the new stone road through Kouts, Dunns Bridge, North Judson, Winamac, Star City and Royal Center; also the direct road from Logansport to Richmond probably via Galveston, Anderson and New-castle.—H. E. Nicholson.

There is so much road repair work being done to the south of us that about the only road clear now is that through Roseland, Kensington, Riverdale, Dolton, Oak Glen, Lansing, Munster, Maynard, Dyer, Schererville, Merrillville, Ainesworth, Deep River, Valparaiso, Kouts, Dunns Bridge, Tefft, San Pierre, North Judson, Bass Lake, Beardstown, Winamac, Star City and Royal Center.

In the run to Richmond, you can follow a road through Walton, Galveston, Kokomo, Tipton, Elwood, Franklin, Anderson, Muncie and 48 m. to Richmond through Oakville, Springfield, Newcast, Hagerstown and Greens Fork.

A Blue Book 4 will be found useful should complete running directions be desirable.

Pontiac, Mich.—Shreveport, La.

Pontiac, Mich.—Editor Motor Age—Please furnish me with routing, road conditions, etc. I wish to drive from Pontiac, Mich., to Shreveport, La., leaving the latter part of September.—A. B. Cheney.

First running into Detroit, then turning west your journey will be to South Bend, 200 m., via Ypsilanti, Ann Arbor, Chelsea, Jackson, Albion, Battle Creek, Kalamazoo, Paw Paw, Dowagiac, Niles; South Bend to Ottawa, 153 m., via La Porte, Valparaiso, Dyer, Frankfort, Joliet, Channahon, Morris; Ottawa to Davenport, 107 m., via Hollowayville; Sheffield, Geneseo, Moline; Davenport to Des Moines, 187 m., via Iowa City, Newton, Colfax; Des Moines to St. Joseph, 193 m., via Mount Airy, Grant City, Stanbury; St. Joseph to Hiawatha, 42 m.; Hiawatha to Topeka, 70 m.; Topeka

to Emporia, 75 m., via Osage City; Emporia to Wichita, 107 m., via Newton; Wichita to El Reno, 184 m., via Wellington, Caldwell and Enid; El Reno to Lawton, 113 m., via Pocomet; Lawton to Wichita Falls, 60 m., via Burke Burnett; Wichita Falls to Ft. Worth, 124 m., via Henrietta, Bowie and Decatur; Ft. Worth to Dallas, 32 m.; Dallas to Shreveport, 220 m., via Terrell, Minneola, Big Sandy and Marshall.

There is a shorter route which may be followed but it is not to be recommended, as the roads south of St. Louis are in bad condition. But should you wish to try it, after following down the Mississippi river via Burlington, Ft. Madison, Keokuk, Quincy, Hannibal, Louisiana, Moscow Mills and St. Charles to St. Louis, then continue via Ste. Genevieve, Cape Girardeau, Jonesboro, Forrest City, Little Rock, Hot Springs, and Texarkana to Shreveport, but people from that section of the country prefer the route through Dallas and Ft. Worth.

It would be well to provide yourself with volume 4 and 5 of the Automobile Blue Book. Volume 4 covers the Middle West while volume 5 embraces the remaining section which your route crosses.

Marion, O.-Rochester, N. Y.

Marion, O.—Editor Motor Age—Please give me the best route from Marion, O., to Rochester, N. Y.—H. S. H.

Running up to Bellevue from Marion, a distance of 55 m. via Bucyrus and Bloomfield, you will reach the main traveled route to Buffalo, which takes you through Norwalk, Elyria, Cleveland, Willoughby, Painesville, Geneva, Ashtabula, Conneaut, Girard, Erie, Ripley, Westfield, Brocton, Fredonia, Silver Creek, Irving and Evans, 261 m.; Buffalo to Rochester 67 m. via Bowmanville, Crittenden, Curfu, Batavia, Leroy, Caledonia, Mumford and Scottville.

The Blue Book 4 to Buffalo and the 1 to Rochester will give complete road directions.

Cincinnati, O.-Peoria, Ill., via Indianapolis

Newport, Ky.—Editor Motor Age—Please let me know the route from Cincinnati, O., to Indianapolis, Ind.; and from Cincinnati, to Peoria, Ill. Also, how many miles each route covers, and about how long it would take to traverse these routes in a Ford car.—Thos. Tattershall.

Indianapolis is 116 m. from Cincinnati via the following route: Cheviot, Miami, Harrison, New Trenton, Brookville, Blooming Grove, Connorsville, Rushville, Morristown, New Palestine.

To reach Peoria continue from Indianapolis to Champaign, 129 m. via Brownsburg, Jamestown, New Ross, Crawfordsville, Waynetown, Veedersburg, Covington, Danville, Homer, Urbana; Champaign to Bloomington, 52 m. via Mahomet, Farmer City, Le Roy, Downs; Bloomington to Peoria, 44 m. via Danvers, Mackinaw, Tremont.

The average Ford car can make about 40 miles per hour over such roads as are to be found on these routes, provided the car is not over weighted.

You will find the explicit running directions in the volume 4 Blue Book.

Center Junction, Ia.-O'Neill, Neb.

Center Junction, Ia.—Editor Motor Age—Kindly give me detailed route from Center Junction, Ia., to O'Neill, Neb.

I will appreciate the mileage between the towns, also the total mileage.—M. G. Alsever. Traveling to Cedar Rapids, a run of 35 miles, will bring you to Marengo where you will strike the River to River road; Marengo to Des Moines is 198 m. via Victor, Grinnell, Kellogg, Newton, Colfax, Altoona; Des Moines to Atlantic, 94 m., over the White Pole road via Adell, Dexter, Casey, Wyota; then returning to the River to River road, Atlantic to Omaha, 144 m., via Avoca, Minden, Underwood, Council Bluffs; thence to Columbus over the Platte Valley route, 84 m., via Waterloo, Fremont, Ames, Schuyler, Benton; thence north via Humphrey, Norfolk, Plainview, Orchard, and Emporia to O'Neill, making a journey of about 730 miles.

New York-Liberty, N. Y.-Philadelphia

Amityville, L. I.—Editor Motor Age—Please give me the best route from New York to Liberty, N. Y., returning by way of Philadelphia, Pa. Trip to be taken the last week in August.—C. Dittmann.

An interesting way to go to Liberty would be to take the ferry at 42d street to Weehawken, then via Arlington turnpike to Belleville; thence to Bloomfield, Montclair, Verona and Caldwell to Pinebrook; crossing the Rockaway river the road leads to Parsippany, Danville, Rockaway, Dover and Kenil; turning north at Kenil run through Mt. Arlington to Lake Hopatcong; then to Woodport; Sparta, Franklin Furnace, North Church, Ackerson, Branchville, Layton, Tri-States, Port Jarvis, Mongaup Valley to Liberty.

Returning to Port Jarvis the route follows the Delaware river through Milford, Dingman's Ferry, Bushkill, Shawnee-on-Delaware to Delaware Water Gap; from Dela-

ware Water Gap to Philadelphia via Saylorsburg, Wind Gap, Easton, Bethlehem, Allentown, Old Quakertown, Montgomeryville, Ferry to Camden, then via Bridgeboro, Columbia, Trenton, Kingston, New Brunswick, Rahway, Elizabeth, Newark, Jersey City and the Weehawken ferry into New York.

This trip takes you through very scenic country, and to still lengthen your trip to take in more attractions of the state, a Blue Book No. 3 will be found very useful in giving detail running directions to all points of interest.

Marion, O.-Burlington, Ia.

Marion, O.—Editor Motor Age—I would like to know the best route to Burlington, Ia. Would it be via Indianapolis and Bloomington, Ill., or by the way of Chicago? Could I find good roads via Ft. Wayne, Ind., and Peoria, Ill., and across the river at Ft. Madison?—S. W.

Your best and most direct route will be Marion to Lima, 53 m., via Kenton; Lima to Lafayette, 165 m., via Spencer, Mercer, Petroleum, Marion, Kokomo, Middlefork; Lafayette to Bloomington, 118 m., via Oxford, Hoopston; Bloomington to Peoria, 43 m. via Danvers, Tremont; Peoria to Galesburg, 54 m. via Farmington, Maquon, Knoxville; Galesburg to Burlington, 50 m., via Monmouth, Okawka.

Yes, you would find good roads via Ft. Wayne and Peoria, but the route given from Peoria to the river is preferable to that into Ft. Madison, as it avoids some hills.

Muskogee, Okla.-Memphis

Muskogee, Okla.—Editor Motor Age—Please give the best touring route from Muskogee to Memphis, Tenn., regardless of the distance.—F. Smith.

Making a long trip to your destination will be no better than the direct road, as you will eventually have bad roads to travel over just the same.

The short route lies to Warner, Webbers Falls, Sallisaw, Fort Smith, Paris, Dardanelle, Plumersville, Wooster, Conway, to Little Rock; Little Rock to Memphis, 162 miles, running through Galloway, Lonoke, Prairie Center, Hazen, Clarendon, Brinkley, Forrest City, Madison and Mound City.

Moline, Ill.-Peabody, Kan.

East Moline, Ill.—Editor Motor Age—Kindly publish the best route from Moline, Ill., to Peabody, Kan.—H. S. Cartwright.

Take the River-to-River road from Davenport to Des Moines, leading through Durant, Wilton, West Liberty, Iowa City, Tiffin, Homestead, Marengo, Victor, Grinnell, Kellogg, Newton, Colfax, a distance of 187 m.; Des Moines to Omaha 158 m., over the White Pole road to Atlantic, via Waukegan, Dexter, Casey and Wyota, then continuing on the River-to-River road via Walnut, Minden, Underwood and Council Bluffs; Omaha to Hiawatha 123 m., via Fort Crook, Plattsmouth, Nebraska City, Howe, Falls City; Hiawatha to Emporia 146 m., via Horton, Holton, Hoyt, Topeka, Burlingame, Lebo; Emporia to Peabody 64 m., over Santa Fe trail via Saffordville, Cottonwood Falls, Clements and Florence.

Virginia to New York

Gate City, Va.—Editor Motor Age—I am planning a trip from Gate City, Va., to New York, and I know the road to Bristol. I would like the running directions from Bristol, via Roanoke, Natural Bridge, Winchester, Washington, Baltimore, Atlantic City, and New York, then the nearest route to return by mentioning the places of most interest to visit. I would like to know the distance and time it will take to make the trip.—A. McG. Wallace, M. D.

It is not possible for Motor Age to give running directions on any road on account of lack of space in this department, but from Roanoke you will be able to find all directions, distances and other valuable information in the volume 3 Blue Book, which can be secured from the Automobile Blue Book Publishing Co., 2160 Broadway, New York.

On the whole, a very good road between Bristol and Roanoke lies through Abingdon, Marion, Wytheville, Pulaski City, Christiansburg, and Salem. Roanoke to Winchester is 92 m., and a stone road practically all the way through Mt. Crawford, Harrisonburg, New Market, Edinburg, Woodstock, Maurertown, Strasburg, Middletown, Winchester; to Washington, via Frederick, is 152 m., by way of Berryville, Halltown, Harpers Ferry, Knoxville, Frederick, Hyattstown, Gaithersburg, Rockville, and Dupont Circle. A run of 153 miles lies to Philadelphia and is through Relay, Baltimore, Bel Air, Havre de Grace, Newark, Wilmington, Chester, Darby. You can then make the run to Atlantic City, but as you route through Philadelphia on your return trip, you might prefer to leave the Philadelphia road at Wilmington and go direct to the coast through

Penn's Grove, Woodstown, Franklinville, Mays Landing, and Atlantic City.

A run of 133 m. will take you on to New York, passing through Pleasantville, Manahawkin, Waretown, Forked River, Toms River, Lakewood, Freehold, Mattewan, South Amboy, Perth Amboy, Elizabeth, Newark, and the ferry to New York at Weehawken.

The direct road back to Philadelphia is 62 m. to Trenton, via Newark, Elizabeth, Rahway, Metuchen, New Brunswick, Kingston and Princeton; and 39 m. to Philadelphia, through Bordentown, Bridgeboro and Camden.

For points of interest see issue of May 8, page 24.

Kansas to Pacific Coast

Beloit, Kan.—Editor Motor Age—I want to tour through the west. Would it be too late in the season to go by way of Denver and Salt Lake City, starting about October 1, spend a week around Denver and then cross the mountains. If too late, then give best route to follow through the southwest, giving some of the worst difficulties to be met and principal things of interest. How much sand would we find in miles. State distances from Kansas City by both routes.

Would a light 20-horsepower car be strong enough for the trip? What is the cost of gasoline in California and en route?—A Subscriber.

October will be too late to attempt a trip to the coast via Denver, on account of snow in the high altitudes. Therefore you should run south from Beloit over the Sunflower trail via Victor, Sylvan Grove, Wilson and Claflin to Ellinwood, 106 m.; then taking up the Santa Fe trail from Ellinwood to Dodge City, 98 m., via Great Bend, Kinsley and Spearville; leaving the Santa Fe trail, Dodge City to Amarillo, 289 m., via Rheinhart, Fowler, Plains, Springfield, Liberal, Tyrone, Hooker, Guymon, Goodwell, Texhoma, Stratford, Tena P. O., Ruby Ranch, Dumas; Amarillo to Plainview 84 m., via Canyon City, Nina, Happy and Tulla; Plainview to Roswell, 269 m., via Abernathy, Lubbock, Brownfield, Gomez, Plains, Broncho. The remainder of the routing to the coast will be found in a communication headed Oklahoma City, Okla.—Portland, Ore., in this issue of Motor Age.

The cost of gasoline will vary from 20 cents to 70 cents a gallon. Your worst difficulty will be in negotiating stretches of sand, but cars are covering these roads every day and you should be able to make the trip without serious trouble. A 20-horsepower car, while rather light for extensive touring, should serve you very well provided it is not overloaded.

Approximate distance from Beloit to San Francisco via Denver and Salt Lake is 1,886 m.; via Borderland route, through El Paso and San Diego, 2,802 m.; the distance from Kansas City to Wilson is 269 m.

Clinton, Ia.—Plankinton, N. D.

Kirkland, Ill.—Editor Motor Age—Kindly inform me where I can obtain, or furnish me, direct route from Clinton, Ia., to Plankinton, S. D.; also the price of such information.—Clair Luckett.

The Official Iowa Transcontinental route leads west from Clinton to Cedar Rapids 88 m., via DeWitt, Lowden, Mechanicsville, Marion; Cedar Rapids to Marshalltown, 76 m., via Belle Plaine, Tama, Montour; Marshalltown to Boone, 55 m., via State Center, Ames; turning north at Boone to Webster City, 35 m.; Webster City to Fort Dodge, 21 m.; Fort Dodge to Sioux City, 136 m., via Rockwell City, Sac City, Correctionville, Sioux City to Sioux Falls, 95 m., via Westfield, Hawarden, Beloit; Sioux Falls to Plankinton, 100 m., via Dolton, Bridgewater, Alexandria, Mitchell and Mt. Vernon. No charge is made by Motor Age for outlining any route; the Routes and Touring department is maintained for the benefit of our readers. For complete running directions, see the Automobile Blue Book, Vol. 5.

Huron, S. D.—Omaha—Great Falls, Mont.

Huron, S. D.—Editor Motor Age—Kindly give me two good routes from Huron, S. D., to Omaha, Neb., so that I can go one way and return another if I wish to. Also give me a good route from Huron to Great Falls, Mont., via the Black Hills of South Dakota, and one through North Dakota.—Harry O. Wilbirt.

As you wish to go one way and return another Motor Age would suggest your running east through Manchester, Lake Preston, Oldham, Ramona, Madison, Wentworth, Chester, Colton, Lyons to Sioux Falls, a distance of 134 m.; Sioux Falls to Sioux City, 95 m., through Canton, Beloit, Fairview, Hudson, Hawarden, Akron, Westfield; Sioux City to Omaha, 109 m., through Salix, Whitney, Council Bluffs. An option to the section of the route from Sioux City to Omaha which may be preferable in wet weather although less scenic is through Homer, Winnebago,

Walthill, Lyons, Oakland, Craig, Tekama, Herman, Blair and Florence, 112 m.

Returning to Huron, go west from Omaha to Columbus, 84 m., through Elkhorn, Waterloo, Fremont, Ames, Schuyler, Bentor; turning north at Columbus to Yankton, 121 m., follow the Meridian road through Humphrey, Madison, Norfolk, Pierce, Wausa, Crofton; Yankton to Huron, 206 m., through Freeman, Bridgewater, Salem, Canova, Howard, Carthage, Esmond, Iroquois.

To reach Great Falls via the Black Hills you will go west from Huron to Pierre, 123 m., through St. Lawrence, Miller, Ree Heights, Bramhall, Highmore, Harrold, Blunt; Pierre to Rapid City, 160 m.; through Hayes, Ottumwa, Philip, Cottonwood, Quinn, Wall, Wasta, Underwood, Boxelder. Rapid City is on the northern edge of the Black Hills so if it is desired to see this section it will be necessary to make side excursions to points of interest. From Rapid City to Sundance is 85 m. through Sturgis—from which point a side trip will take you into Deadwood—White-wood, Spearfish, Beulah. Intermediate towns between Sundance and Helena are Gillette, Sheridan, Billings, Livingston, Bozeman, Townsend; Helena to Great Falls, 110 m., through Silver Station, Wolf Creek Station, Cascade.

The northern route to Great Falls will necessitate your going east from Huron to Arlington, turning north at this point and passing through Watertown and Vernon to White Rock, 197 m.; White Rock to Grand Forks, 175 m., through Wahpeton, Abercrombie, Hickson, Fargo, Mapleton, Hillsboro, Taft, Reynolds, Thompson, Merrifield; to Devil's Lake, 97 m., through Larimore, Petersburg, Mapes, Bartlett, Crary. Continuing west from Devil's Lake the route follows the line of the Great Northern railroad very closely all the way, going 162 m., to Berthold through Rugby, Towner and Minot; to Culbertson, 167 m., through Williston; to Malta, 187 m., through Poplar and Glasgow; to Great Falls, 213 m., through Havre, Box Elder and Fort Benson.

We cannot advise your attempting the trip to Great Falls, Mont., if you are traveling with only one machine in the party. You would have no particular difficulty as far as Devil's Lake, N. D., but beyond that point road conditions are very unstable, due to the constant coming in of settlers, making it impossible to establish permanent roads. Roads at best in western North Dakota and eastern Montana are only trails anyway. Another very serious thing to consider is the crossing of the section of the Bad Lands and what are known as the Mesquite Flats where a stranger will easily become lost. Neither is it wise for a single car to attempt the trip by way of the Black Hills as the roads from Sundance to Helena are not dependable.

The Blue Book, volume 5, will be found of great assistance in making this trip.

Omaha, Neb.—Deadwood, S. D.

Aladdin, Wyo.—Editor Motor Age—Kindly advise me the best touring route from Omaha, Neb., to Deadwood, S. D.—F. H. Mann.

If you will refer to reply to communication from Huron, S. D., in the present issue of

Motor Age you will find a choice of routes between Omaha and Huron, also routing from the latter point to Deadwood.

New Philadelphia, O., to Mt. Carmel, Ill.

New Philadelphia, O.—Editor Motor Age—Kindly give me the best route to Mt. Carmel, Ill., and one through a different section for our return trip.—A. S. Keplinger.

Come south through Tuscarawas to Gnadenhuetten, then to Columbus via Newcomerstown, Coshocton, Adams Mills, Trinway, Frazesburg, Hanover, Newark, Granville and Columbia Center. Follow the National highway to Springfield through Harmony, then route to Richmond, Ind., via Enon, Fairfield, Dayton, Eaton and New Hope, finishing the run into Indianapolis over the National road via Cambridge City, Greenfield and Cumberland.

Between Indianapolis and Terre Haute the itinerary is Plainfield, Reelsville and Brazil, and Vincennes is 63 m. to the south via Sullivan, Carlisle and Bruceville. Mt. Carmel can be reached from Vincennes.

Marshalltown, Ia.—Mankato, Kans.

Albion, Ia.—Editor Motor Age—Please give me the best route from Marshalltown, Ia., to Mankato, Kans. We expect to follow the transcontinental route from Marshalltown to Omaha.—F. S. Thompson.

A run through Newton, Colfax, to Des Moines and then over the Mt. Airy highway through Booneville, Winterset, Afton, Tingley, Mt. Airy, will put you on the Waubesa trail, which you should traverse west to Conway, Gravity, Clarinda, Norwich, Shenandoah, Sidney, Nebraska City, Neb., and Syracuse to Lincoln, leaving Nebraska through Cortland, Beatrice, Harbine, Hebron and Chester, and finishing the run in Kansas through the towns of Belleville, Courtland and Formosa.

Davenport, Ia.—Red Oak, Ia.

Ophium, Ill.—Editor Motor Age—Kindly give me the best route from Davenport, Ia., to Red Oak, Ia. Which volume of the Blue Book gives this route? If I have the Blue Book will I get any use of a road map or does the Blue Book contain one covering this route? The road map I have in mind is Mendenhall's map covering Iowa.—R. H. Ossian.

Your best route will be via Muscatine and Wapello to Burlington; from Burlington west over the Blue Grass trail via Fairfield, Ottumwa, Chariton, Osceola and Creston to Red Oak. Volume 5 of the Blue Book contains all necessary maps and complete running directions for this trip.

Sterling, Ill.—Washington and Keota, Ia.

Rock Falls, Ill.—Editor Motor Age—Please publish the shortest and best route to Washington and Keota, Ia., via Rock Island, Ill.—Geo. W. Curtis.

Your best and shortest route from Sterling to Clinton, 30 m., is via Morrison and Fulton; Clinton to Davenport, 38 m., via Princeton; Davenport to Muscatine, 29 m.; Muscatine to Washington 45 m., to Keota 63 m.

Speed Traps in New England States

Massachusetts

ARLINGTON—Motorists are being summoned into court for failure to slow down and give a signal at cross streets in Arlington, especially in the vicinity of Arlington Center and between Arlington Center and Arlington Heights.

Abington—The police of Abington are enforcing the law requiring motorists to slow down and blow their horns in passing intersecting corners.

Beverly—Chief of Police Woodbury is reported to have issued orders to the police officers of that city to prosecute all those who violate the laws in the future, especially those who fail to slow down and sound their horns upon approaching intersecting streets.

Fitchburg—Chief of Police A. Q. Thayer of Fitchburg has summoned several motorists to appear in court for violation of the motor laws, and claims that from this time on motorists who violate the law will not be allowed to escape a complaint. Some of the streets of Fitchburg are narrow and some of the corners are very dangerous, and owing to this condition more care is required in going through Fitchburg than in some of the other cities of Massachusetts.

Milton—Warning is given that Police Officer Fallon in a Stanley steamer has resumed his practice of coaxing motorists to race with him, and then after he has provoked a motorist to travel faster than he otherwise would, stops him and discloses the fact that he is an officer; later the motorist is summoned into court. Occasionally Officer Fallon is accompanied by Chief of Police Maurice Pierce of Milton. Fallon can easily be

recognized by the fact that he operates a Stanley steamer, which is without number plates, which is permissible under the present law.

Natick—The police of Natick have started the prosecution of motorists for overspeeding in the vicinity of Lincoln square in West Natick, and other principal streets of the town.

Whitman—The police of Whitman are holding up motorists for failure to slow down and blow their horns in approaching the four corners, or center of the village.

Westfield—The authorities of Westfield including the judge of the court are considerably aroused over the fast driving of motorists as well as motor cyclists, which is taking place in Westfield, and several have been summoned into court and fined.

Randolph—The police of Randolph are enforcing the law requiring motorists to slow down and blow their horns in passing intersecting corners.

Rhode Island

Providence—Superintendent of Police John A. Murray of Providence, R. I., has issued the following circular, which was read at all the stations at roll call: "You will read to the officers under your command, general order 17, in relation to the operation of motor vehicles with open mufflers and excessive smoke."

Connecticut

Lyme—The police of Lyme, and especially in Old Lyme, are prosecuting motorists for speeding, before Justice of the Peace George Griswold.

Californian Prepares for 10-Year Tour

DR. L. C. HARVEY, of Upland, Cal., near Los Angeles, after working for years to make an ideal touring outfit, announced during the past week that he had succeeded, and will shortly start with his wife and son on a 10 or 12-year tour throughout the United States, Canada and Mexico.

Dr. Harvey has constructed a trackless train which provides every comfort and even many of the luxuries of home. His motor caravan, consisting of the motor car and two large inclosed wagons, has in the equipment electric lights, running water, screen doors, spacious beds, writing tables and a library. Should the doctor decide to leave the bulky wagons of the train behind he can detach the motor car and tour about with all the comforts still at his command. On a smaller scale he has duplicated the living facilities in the car which serves as a tractor.

A Ford is used, and the car together with the various other conveniences has cost nearly \$10,000. The wagons are of special construction throughout. The floors are maple, the framework of hickory and the siding and ceiling of oak. The furniture is built in as a unit with the body, also of oak. The couplings are arranged so that the two wagons pulled by the Ford will trail around corners and curves in the same tracks where the machine goes.

The water system is arranged with a 15-gallon tank under the car. This tank is connected to the air line that operates the air brakes and the pressure forces the water to the sink for cooking, dishwashing, drinking. The radiator on the Ford is also connected to the water tank and is kept constantly filled for the extra cooking needed at the slow speed.

An air tank on the tractor is kept filled with air by a pump on the engine, from which the tires are filled, the airbrakes are operated, the water forced to the pipes, the horn blown and the motor started.

The electric lights are supplied from a storage battery, which is kept charged by a dynamo on the car. This supplies all lights on the car as well as furnishing light for all purposes about the cars and the camp.

DETROIT TACKLES TRAFFIC PROBLEM

Detroit, Mich., Aug. 18—An ordinance which affects all vehicle traffic has recently been passed and requires that no vehicle shall stand within 30 feet of any fire hydrant. Originally this was only effective within the 2-mile circle, but the police commissioner is making efforts to have it operate all over the city because the large motor car plants now are outside the limited zone. There also is a regulation in force keeping vehicles from in front of the theater entrances, which congests traffic.

To make the down town district safer

at the night rush hour, vehicles are not allowed to stand at the curb between 5 and 6 o'clock in the business section of Woodward avenue. During these same hours a space of 15 feet from the car tracks is marked off by portable posts bearing signs "Safety Zone." Vehicle traffic is not allowed in this zone. With this new system the process of sending horse and motor traffic around the city hall square has been discontinued.

MINNESOTA WOULD RAISE FEES

St. Paul, Minn., Aug. 18—Some action is expected at a special session of the legislature in October to maintain the state license work. The session is to be called for another purpose, but the last legislature adjourned without provision for the department until the new law goes into effect in a year. The secretary of state favors \$5 a year tax, instead of \$1.50 for 2 years as at present. This would add a large sum to the roads fund. Licenses are being issued at the rate of nearly 100 a day. Of 44,000 machines in the state, licenses were issued for 3,000 dealers, and it is believed at least 1,000 cars have not been licensed by their owners. Seventy-five per cent of the new cars are said to be going into country districts.

England Puts Self-Starter on Market

ENGLAND, heretofore averse to the installation of cranks on motor cars, has herself come forward with an electric cranker called the U. M. I. Magician starter, which not only is a compliment to America, but the approval of a movement abroad which found little favor at the outset.

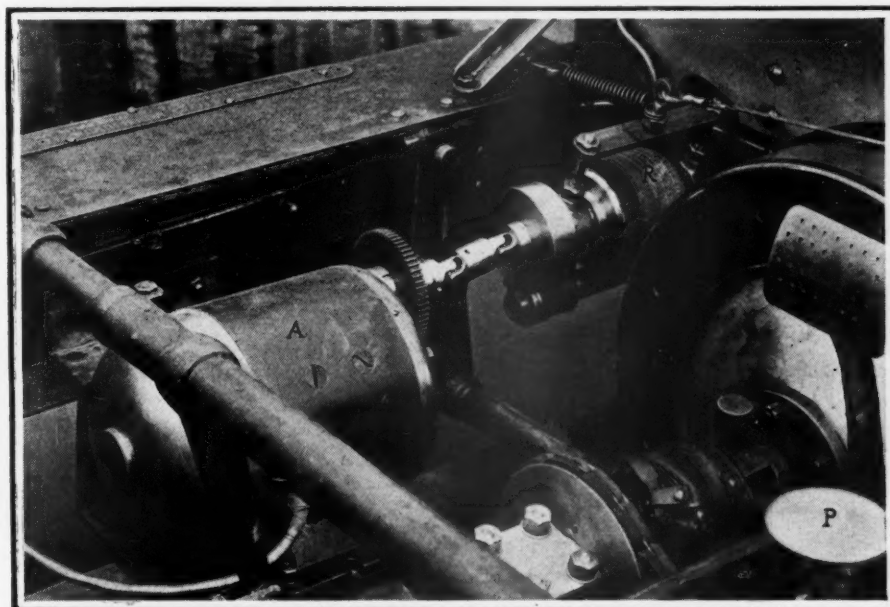
The United Motor Industries, Ltd., London, is responsible for the Magician cranker, which is illustrated herewith,

installed on a 40-horsepower Napier. The feature of this cranker is that it may be installed on any make of car, for it does not require a toothed flywheel, but instead the motor is driven by friction from the cranking motor.

At A, in the illustration, is an electric motor of $\frac{1}{2}$ horsepower, to the front of which is fitted reduction gears with a ratio of 18 to 1. The shaft from the reduction gears is fitted with a universal and is connected indirectly with a friction roller, R.

When the pedal P is pressed a switch is thrown which connects the batteries with the motor A. This causes the motor to rotate and the friction roller R to come in contact with the flywheel periphery, and that member is rotated at a speed of 150 r. p. m. When the engine of the motor car has taken up its functions the pedal P is released, which disconnects the batteries from the motor and hence the latter stops rotating, and automatically the roller R is freed from the flywheel and rotates idly.

It is suggested by the maker that a dynamo, motor-operated, would be helpful in keeping the batteries charged to capacity. The manufacturer states that the Magician cranker is to be desired because of its adaptability to all existing types of motor cars at an astonishingly low figure and without causing any structural alterations to the car to be made. Further, the absence of flywheel gears, cut-outs, etc., make for a simple device.



INSTALLATION OF MAGICIAN STARTING SYSTEM

The motor A indirectly turns the roller R which drives the flywheel

Two New Case Cars in Three Chassis Line for 1914

TWO new four-cylinder cars, the models 25 and 35 of practically the same design and listing at \$1,250 and \$1,850 respectively, with full equipment, comprise the new offering of the J. I. Case T. M. Co., Racine, Wis., for 1914. The line includes another car, the 40 which was marketed last year, but the 1914 car is to be seen with a number of improvements, and selling for \$2,300 instead of \$2,200. The Case 30 of 1913 has been discontinued.

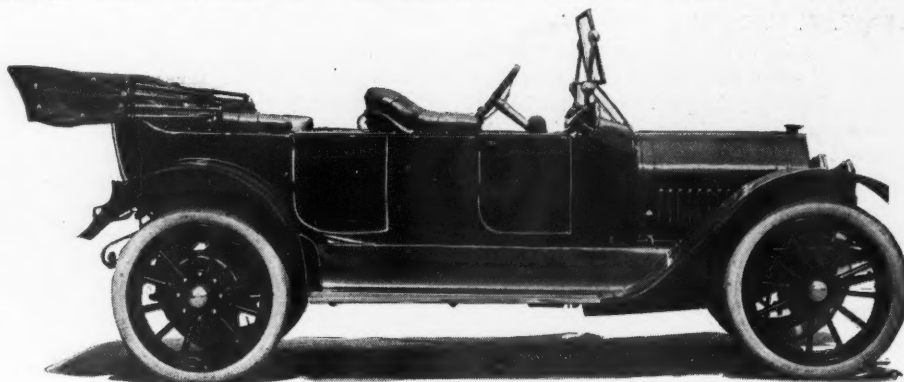
The feature of the entire line for the coming year is the equipment. At the prices above mentioned, will be given a Westinghouse cranking and lighting system, Warner speedometer, 8-day clock, electric vibrator horn, extra tire on a rim, two extra inner tubes, tire cover, weed chains, top, windshield, spark-plug pump, work lamp and a full set of lights. Most of this equipment appeared on the Case 40 in 1913, the exceptions being the spark-plug pump and clock. On this car a pantasote top has been substituted for the mohair used on the 1913 model.

Battery Under Floor Boards

The 25, the smallest car of the line, has a 110-inch. The clean running boards on all the models adds much to the appearance of the cars, this being obtained by placing the battery box under the rear floor boards. The battery on the 25 is a Willard of 80 ampere-hour capacity.

The 25 motor is part of the unit power plant and is of T-head construction, cast in pairs, with a bore and stroke of $3\frac{3}{4}$ by $4\frac{3}{4}$ inches, developing about 34 horsepower on the brake test according to the maker. The valve heads are of nickel-steel and the stems of carbon-steel, the diameter of all valves being $1\frac{1}{8}$ inches. The lift is 9-32 inch. Cover plates are provided for both sets of valves, the covers fastening to ribs on the cylinder casting.

The crankshaft is suspended from three



THE NEW CASE 25

Equipped to the minutest detail this car of 110-inch wheelbase is being offered at \$1,250. Note the clean running boards and extra tire in the rear

FEATURES OF 1914 CASES

Equipment worth about \$350
Left drive, center control
Clean running boards
Electric cranking and lighting
Cowl board for instruments
Platform suspension on small car
Case 30 discontinued

babbitt bearings, dimensions of front being $1\frac{1}{8}$ by $2\frac{5}{8}$ inches, the center $1\frac{1}{8}$ by $2\frac{1}{2}$ and the rear $1\frac{1}{8}$ by $3\frac{3}{4}$ inches. The rod lower bearing is babbitt with a bronze back and measures $1\frac{1}{8}$ by $2\frac{1}{4}$ inches.

Bosch duplex ignition and a non-water-jacketed Rayfield carburetor of 1-inch diameter is used. The magneto is located on the right side of the motor and operated by a shaft parallel to and above the water pump shaft. The carburetor is on the opposite side and is fed by gravity from a 15-gallon tank located under the front seat.

Oil Pump in Crankcase

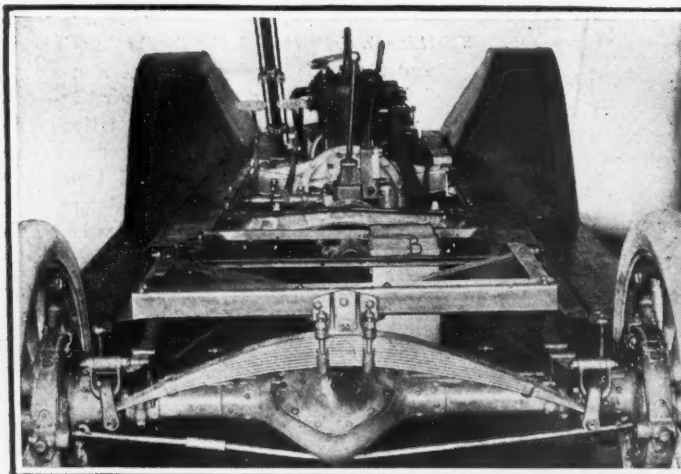
The oiling system contains $1\frac{1}{2}$ gallons of lubricant, and consists of a brass plunger pump, within the aluminum crankcase, with an auxiliary splash. The pump

forces oil to a sight feed and then to the front end gears of the motor, the overflow running to troughs, one under each connecting rod. The overflow from these drops to a sump and from there the oil is carried back to the pump. The motor timing gears are of the helical type, made of cast iron. Cooling is by a centrifugal pump, located on the right side of the motor, the capacity of the cooling system being 4 gallons.

Westinghouse Cranking System

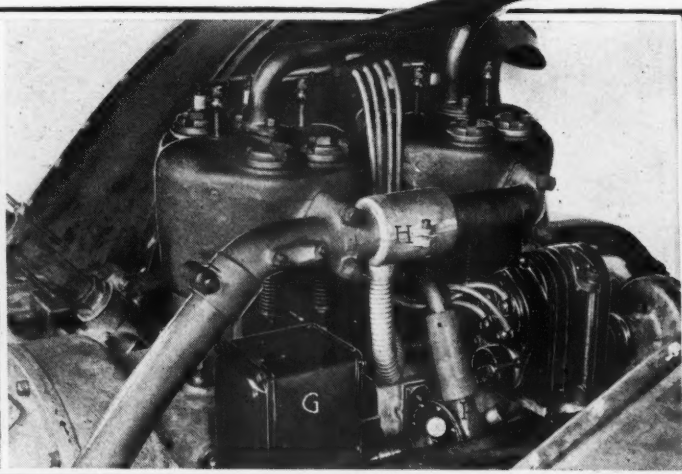
A feature of the 25 power plant is the Westinghouse cranking and lighting installation. This is of the three unit system comprising a generator, battery and motor. The generator is on the right side of the motor and is operated by an extension of the pump shaft. The generator supplies current for the motor, which is on the opposite side and drives directly to the crankshaft by sprockets and chain. An overrunning clutch is provided on the crankshaft sprocket, which makes the starting motor inoperative when the gas motor is firing. The entire motor weighs about 550 pounds.

From the motor the drive is through a



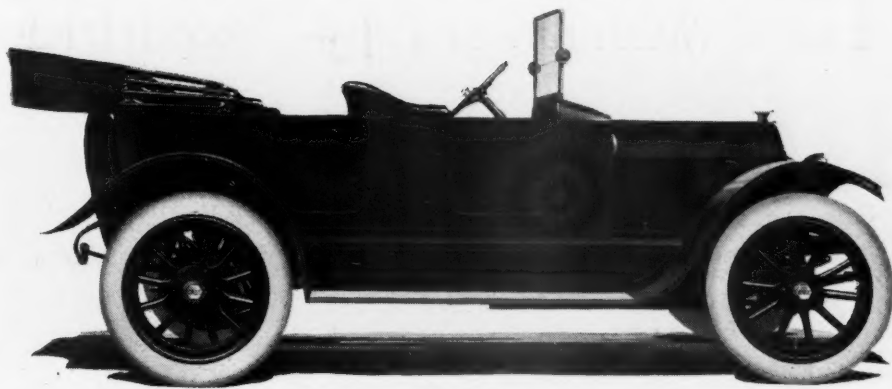
REAR VIEW OF THE CASE 25

The battery box B is directly underneath the tonneau floor boards. Note left drive center control and rear platform suspension



MAGNETO SIDE OF CASE 25 MOTOR

The Westinghouse generator G and water pump P are driven by the same shaft. The clamp H is a hot air connection for the carburetor



ANOTHER NEW CASE, THE 35

Selling at \$1,850 with full equipment. Built on the same general lines as the 25. Many structural refinements in the chassis

disk clutch, steel against steel plates and operating on ball and roller bearings. Here the power is transmitted to the gearset directly behind. This is a Brown-Lipe product and has three forward speeds and reverse and operates on Hyatt bearings. The control lever for the gearset is of the ball type, having a short throw, is located in the center of the chassis and is on a separate platform from the hand brake.

The drive shaft is of 1¼-inch diameter and is inclosed in a torsion tube, supplied with a joint at the forward end. The rear end of course, is fastened rigidly to the rear axle housing. The drive shaft bearings in the torsion tube are Hyatt ball bearings. Weston-Mott has supplied the rear axle for the 25 Case. This is of the three-quarters floating type, operating on Hyatt and New Departure bearings and inclosed in a malleable iron housing.

Nut and Screw Steering

The steering wheel is of the Jacox nut-and-screw type, and is on the left side of the chassis. Two sets of brakes, without equalizers are provided, both being faced with non-burn material. The brake diameter is 12 inches. The rear spring suspension is of the platform type, the cross piece being linked freely to the semi-elliptic side members. The weight of the entire car, equipped fully, is given as 2,500 pounds. Facilities for carrying extra tires are in the rear of the chassis as the illustration on this page shows. Tires are the same size all around being 32 by 4-inch Goodyear on Q. D. rims.

At \$1,250 the Case 25 will be marketed in five-passenger touring form. The body is of sheet steel and incorporates the new ideas brought out by manufacturers for the coming season. The cowl boards, holds the ignition switch, sight feed, clock speedometer, and lighting switch. The cowed dash is something new in case body construction and is to be seen on the 35 and 40 as well as the small car.

The Case 35 differs in many respects from the 25 just described, but as far as the general chassis and body design is concerned, it is the same. Here a unit

power plant is used, the motor being of four-cylinders, of T-head construction, cast in pairs. The bore and stroke is 4¼ by 5½, developing 46 brake horsepower at 1,700 r. p. m.

The valve lift in this case is ⅝-inch. The oiling system is the same as the smaller model, but instead of using a plunger pump, a gear pump is used, it being located in the crankcase as before. Bosch dual ignition is used and a water-jacketed carburetor of 1¼-inch diameter. The location of these and other parts is the same as in the 25. The capacity of the water system is 5 gallons and of the oiling system 1¼ gallons. In other respects the two motors are the same.

The clutch is of the disk type with plates of steel against rabestos, and supplied with a brake to prevent spinning. The drive from this unit is to a Brown-Lipe three-speed selective gearset, which is part of the unit power plant. The gearset operates on Timken roller bearings. The propulsion means differs from

the 25, in that a V-shape torque member is used instead of the tube. The universal is a Spicer double. Another point of difference is to be noticed in the floating rear axle, the Case 25, as before stated being equipped with a semi-floating.

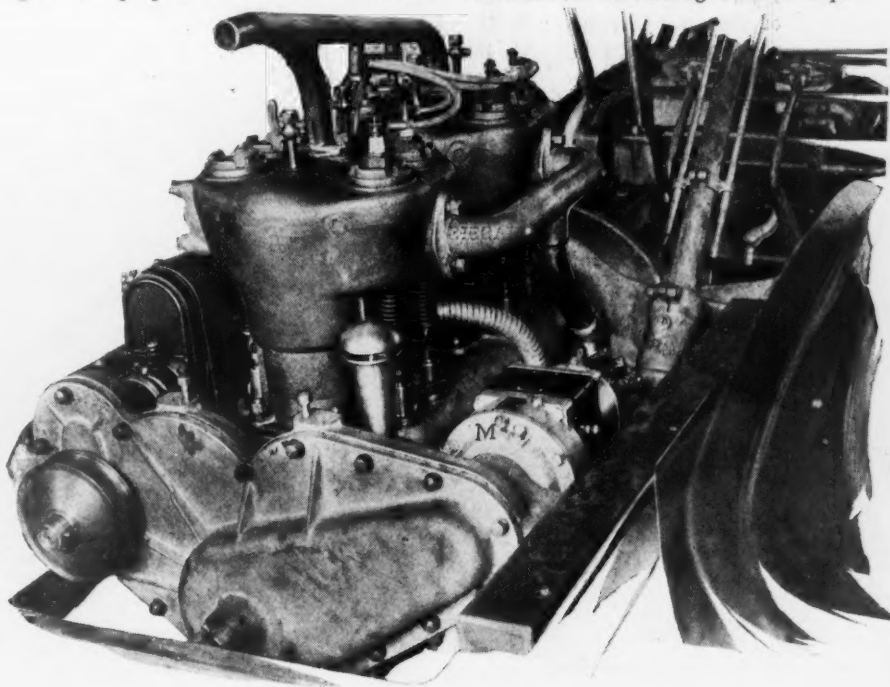
Two sets of brakes, of 14-inches diameter are provided, the foot brake being supplied with equalizers. Both front and rear wheel bearings are of the ball type, all wheels carrying 35 by 4½-inch tires, on Firestone Q. D. rims. Another important point wherein this car differs from the 25 is the rear suspension, which is of the three-quarter elliptic type. The wheelbase is 120 inches. In the matter of equipment, the 35 leaves the factory with the same list as the 25, the body design in this case being almost identical with that of the little car.

Case 40 Changed Little

Very few changes are to be noted on the 124-inch wheelbase model 40 Case. The most important one is the adoption of the Bosch two-point ignition. On the 1913 model the Bosch dual was used with another make as optional. A new type of Rayfield carburetor has been brought out and the air pump for the pressure gasoline feed changed from the left to the right side of the motor.

The rear axle shafts have been made heavier and of better material. The cowl board with the instruments is something new on the 40, but in other respects the car will appear as in 1913. The motor is part of a unit power plant of four cylinders cast in pairs, of 4¼ by 5½ inch bore and stroke. The rest of the 40 chassis is similar in design to the 35.

In marketing the Case 40 this year the price has been increased to \$2,300, the additional equipment and improvements in construction warranting such a step.



ANOTHER VIEW OF THE 25 MOTOR

Showing the Westinghouse cranker M which drives by chain and sprockets to the crankshaft. Note the cover extension for the chain

Vulcan 27 at \$750 Latest Addition to Low-Priced Field

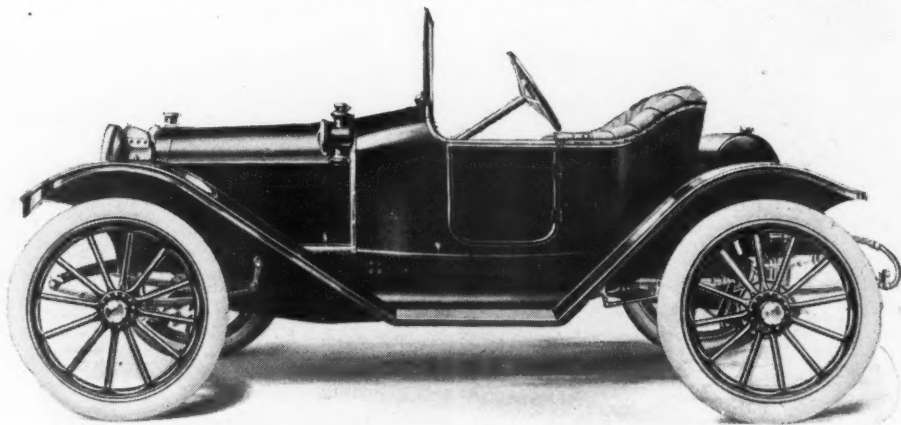
WITH as much forethought in establishing a business foundation as in building a motor car, the Vulcan Mfg. Co., Painesville, O., announces its ability to put on the market immediately one chassis and two body types, a speedster and a family car, the former selling for \$750 and the latter for \$850. This company did not give any publicity to its product until the time came for actual marketing, the greater part of the time up to this date being taken up with the installation of special machinery and tools, for the Vulcan car is made entirely within the shops at Painesville.

It is interesting to note that the factory location is ideal, the city bordering on Lake Erie, where shipments may be made by steamer; the town of Painesville is not far distant from the center of population of the United States, Bloomington, Ind., and within a stone's throw of Cleveland, the claimed focusing point of the metal trade. The Vulcan plant is ideally located with reference to the railroads to and from the city.

Four-Cylinder Motor

The single chassis manufactured by the Vulcan company has mounted upon it a unit power plant, part of which is a motor of four cylinders, of L-head construction and cast in block. The motor dimensions are 3½ by 5 inches with a staunch crankshaft and camshaft and large bearing surfaces. Both shafts are drop-forgings, the camshaft having the cams integral and the crankshaft and flywheel flange being one piece.

Lubrication is by splash-pressure system, a plunger pump forcing oil from a reservoir to all bearings and gears, the lower half of the crankcase acting as the retainer for the splash supply. A float gauge at the base of the motor indicates the level of the lubricant in the case. The ignition system dispenses with batteries and a coil, using only a high-tension mag-



VULCAN 27 MADE ENTIRELY IN ONE SHOP

A product of Painesville, O., selling at \$750 with full equipment, Roadster wheelbase 105 inches, Touring car 115 inches

FEATURES OF NEW VULCAN

*Made entirely in one shop
Touring car for \$850.
Differential has five pinions
Left drive, center control
Long stroke motor*

neto. A 1-inch carbureter of standard make is used.

For a motor of this size it was decided that thermo-syphon cooling is best. The waterjacket space and hose connections are of large size to insure free circulation of water and as an auxiliary a 12-inch fan is used, in front of a vertical tube radiator.

All the valves are inclosed, removable cover plates being provided for the inspection of the valve mechanism. The valve diameter is given as 1⅝ inches.

Cone Clutch of Large Diameter

Behind the motor is a cone clutch of 13 inches diameter and with a 1½-inch leather face, the pressure being maintained by eight spiral spring exerting force against the clutch web at one end and a

pressed-steel spring spider acting on the other. A long leverage is obtained on the clutch pedal so that little effort is required to operate that member, this feature being especially desirable for women.

From the clutch the drive is taken by a three-speed selective gearset with gears of 3½ per cent nickel steel, according to the maker, and of ¼ to 1⅝-inch face. This makes for extremely long life and quiet operation. A ball-and-socket joint holds the gearshift lever, which operates with a short throw. The lever is located in the center of the chassis.

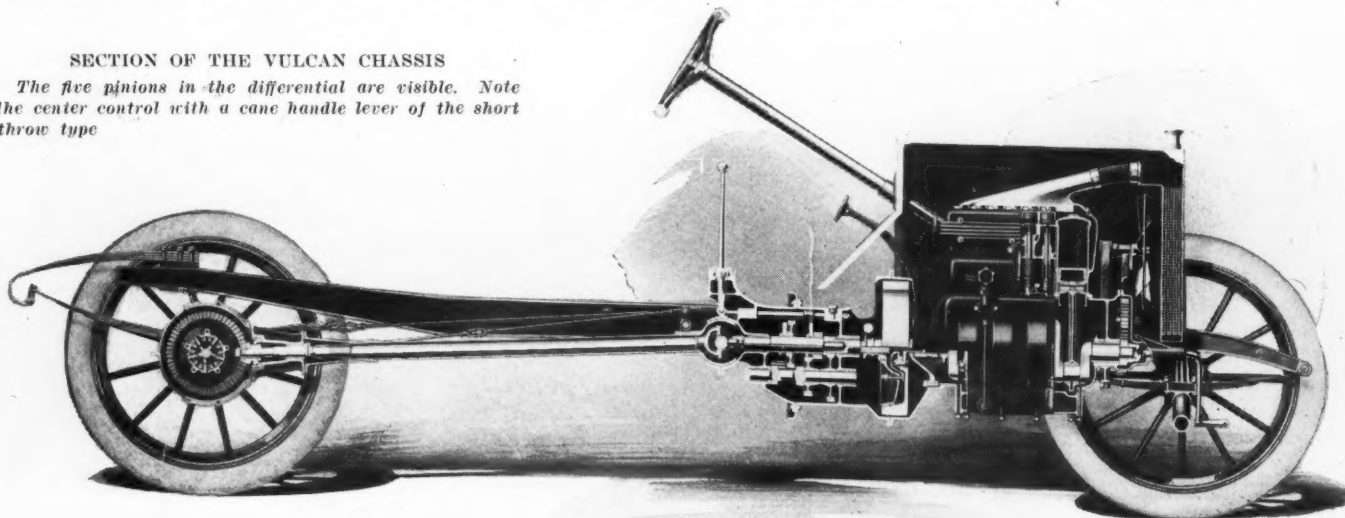
Drives Through Torsion Tube

The universal at the forward end has its housing cast integral with the rear half of the gearset case, the ball and socket joint formed being made by a torsion tube. The drive is taken from the gearset by a shaft to a semi-floating rear axle operating on ball bearings. Particular pains have been taken in cutting and treating the driving pinion and differential gears.

The feature of the differential is that

SECTION OF THE VULCAN CHASSIS

The five pinions in the differential are visible. Note the center control with a cane handle lever of the short throw type



five pinions are used instead of four or three as in a number of cars, the maker claiming that the additional pinion increases the life of the differential considerably. It is announced the pinions are of nickel-steel mounted on phosphor-bronze bushings and operating on a drop-forged spider. The differential housing is provided with a cover plate, so that inspection will be facilitated and also to permit of the changing of lubricant.

Two sets of brakes are used, one internal expanding and the other external contracting, both being asbestos faced. The wheels carry 32 by 3½-inch tires which are

of ample size for the weight of the car—1,750 pounds. The steering is done from the left side, the post being of the rack-and-pinion type.

Deviating from the conventional, the Vulcan car is to be seen with a tubular front axle dropped slightly at the center. Aside from being accurate and living up to specifications in chassis materials, the body is given no little attention. It is built of oak, reinforced with drop-forged body irons and covered with sheet steel. The high back and wide seats are other desirable features and to obtain still more comfortable riding the seat upholstery has

been made thick and of material which will not show signs of wear in a short time. The hood, fenders, gas tank and running gears are finished with two coats of black japan. The body is finished in olive green of a dark shade.

The speedster appears with a 105-inch wheelbase and the family car with 115 inches between wheel centers, both cars leaving the factory with the same list of equipment, namely, top with side curtains, windshield, speedometer, Prest-o-lite tank and two gas headlights, oil side and tail-light, tire repair kit and pump, jack and a set of tools.

Moline New Series M-40 Has Floating Rear Axle

ALTHOUGH a disbeliever in yearly models, the Moline Automobile Co., East Moline, Ill., has brought out at this time a new series, which is not a 1914 model, but a car refined and improved with the views of the factory engineers. The name of the series brought out last summer, the M-40, will be continued.

The most important change which has taken place has been the adoption of the floating rear axle, which supplants the semi-floating type used on the older series. The Weston-Mott company supplied the semi-floating and is responsible also for the new axle. The wheels are carried on double annular ball bearings and the wheel flange is fastened to the wheel by eight studs and nuts. This type of rear construction permits of the removal of the axle shafts without disturbing the wheels and without jacking up the rear end. The differential is carried on Hyatt high-duty roller bearings, a means of adjustment being provided, which requires only the loosening of four bolts.

Besides the adoption of a new type of rear axle, another important change has taken place. The new Moline will be seen with a new type of touring body and one which is in accordance with the latest views in this direction, that of making the rear of the body bell-shaped. Another refinement is to be noted, in the addition to the equipment of an ammeter, which shows at a glance whether the battery is discharging, being charged, or not being charged.

NEW MOLINE FEATURES

Floating rear axle adopted

New type of body with bell-shaped back

Ammeter on dash added equipment

Cranking generator changed slightly

Price remains unchanged

In the matter of motor changes only two are to be seen on the new series, one being the lightening of the pistons. This decrease in weight of the reciprocating parts makes for less vibration and wear. The generator of the Ward-Leonard cranking and lighting system has been changed slightly.

Aside from the changes mentioned the Moline new series M-40 will come through as before with a four-cylinder motor of 4½-inch bore and 6-inch stroke, which come in the class of the true long-stroke motors. The cylinders are of L-head construction, cast in pairs, with the valve mechanism inclosed. Non-circulating splash-pressure lubrication and thermo-syphon cooling are retained. Ignition is by Bosch double system and carburetion by Schebler with a dash control, the fuel being fed by gravity.

A cone clutch and three-speed selective gearset are used, the latter driving through shaft to the now floating rear axle. The tires are the same all around, being 35 by 4 inches. Right drive and right gear-shift control and the 124-inch wheelbase are again to be seen on Moline cars.

Standard equipment at the unchanged price, \$1,950, consists of Ward-Leonard cranking and lighting system, top and cover, windshield, demountable rims and extra rim, speedometer, complete set of tools and full set of lights.

NEW MOON ON ROAD

The first of the 1914 model 42's of the Moon Motor Car Co. were put on the roads for tests this week. The testing has been started earlier than in previous years, partly because of additional equipment which has been added to the factory in the last year which facilitates the work and partly because the factory has been run overtime for several weeks.

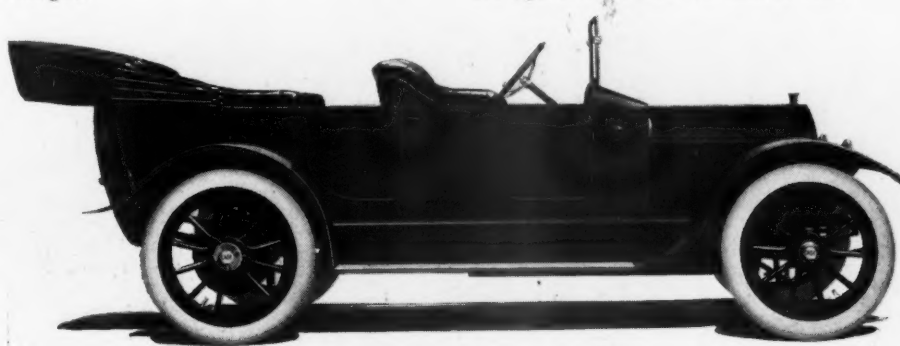
Among the new things is a motor-driven tire pump which engages with the flywheel. The force-feed system is used for the gasoline, the gasoline tank being on the rear of the car. A compartment in the cowl for the smaller tools does away with the running-board tool box. The batteries are lashed under the body so that with the extra tires on the back the running boards are left entirely clear.

NEW MARION SIX

The Marion Motor Car Co., Indianapolis, announces the addition of a six-cylinder to its line, which is offered for 1914 consideration. One chassis is used, but two body styles are listed, one a five-passenger touring car and the other a two-passenger roadster. The wheelbase is 124 inches and the tires are 35 by 4½. The motor is of the L-head type, with 3¾ by 5½ cylinders cast in threes. A self-starter, left drive and center control are features. The list is \$2,150 fully equipped.

PARTIN-PALMER A SIX-PASSENGER

A mistake was made in the description of the new Partin-Palmer, published on page 29, issue of Motor Age August 14, in stating that it was a five-passenger car. It is a six-passenger; indeed, the extra seat is one of the talking points of the new model, this being secured through the use of two auxiliary seats. Two sit in the front seat, two on the rear and the other two on the folding seats. The Partin-Palmer is marketed by the Partin-Palmer Mfg. Co., Chicago, at \$975.



NEW SERIES MOLINE M-40

This car is now equipped with a floating rear axle. A new type of body with a bell-shaped back has been adopted



Housing the Motor Car

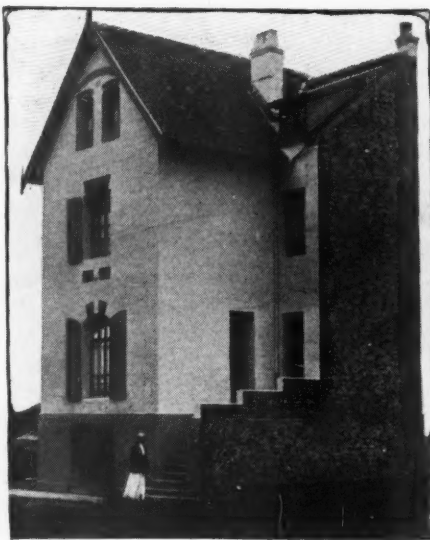
The Garage for the Monied Class

WHILE anxiously awaiting definite action on the democratic tariff and currency bills, protesting against the high cost of gasoline and wondering how to buy coal after going into voluntary bankruptcy during our summer vacations, we can find some consolation in the fact that here in America we have no serious garage problems such as menace the tranquility of the British and French motorists. To lapse into the vernacular, we should worry.

In the large cities of England and the continent, the garage problem is acute. Land on which to build a private boudoir for the motor car is at a premium and the housing of the machine is considered a "bally nuisance" in London and the cause for many an exasperated exclamation in Paris. While the American motorist is contemplating ways and means for improving his garage, the car owner of Europe is figuring how he is going to get a garage, no matter how crude, in which to store his motor car.

In our sister republic across the Atlantic, the French architects are grappling with the problem and have met with some measure of success. The answer is seen in the accompanying illustrations. In a large number of the new houses that are being built in the capital of the gayest of nations, an apartment for the motor car is regarded as essential as a drawing-room or dining-room.

Not only are the more pretentious houses equipped with garages, but the smaller and humbler dwellings as well. In some cases, even, terrace houses have their own garages, as can be seen in a lower illustration, where the garage door is shown next to the front door, an excellent location especially on a cold winter's morning, when the American motorist either must wade through the snow or shovel a path to his garage door in order to get to his car.



FRENCH GARAGE IN BASEMENT

M. Bleriot, the famous aviator, has accepted the inevitable and has had a garage built in connection with his house at Harelott, which is one of the finest places in the world for aeroplaning. M. Bleriot varies his flights in the air with the sport of sand-yachting on the stretch of beach immediately in front of his house, which is within a few hundred yards of the sea. The Bleriot garage is a model establishment and the noted aviator may be said to hover over his car during the night, as the bedrooms extend over the garage.

CALIFORNIA ROADS

San Francisco, Cal., Aug. 16—California wants and is going to have two trunk roads, north and south, and its well defined plan presents an object lesson to other states of great distances and emphasizes the fact that the through road is a modern necessity in a general system of improved highways.

"The recent report of the advisory board of the California highway commission makes clear the difference in the conditions on the Pacific coast and those of the eastern and central portions of the country," comments P. J. Walker, of San Francisco, president of the California State Automobile Association, the A. A. A. body of northern California, which is working hard for good roads.

"The California law requires roads to be built the length of the state along the most direct and practicable routes; one along the coast and the other traversing the Sacramento and San Joaquin valleys with lateral roads to such county seats as may not be on the main lines. For constructing these roads \$18,000,000 was voted 2 years ago. The motorists naturally worked for this legislation, and it is worth noting that California has more motor cars than France, in excess of 75,000, and still they are coming.

"With the amount of money provided, the utmost economy must be practiced and shortest possible routes followed to comply with the law. To build roads that will stand the strain of much motor travel the state highway commission has adopted concrete for almost the entire system. In building the road the grade is prepared and drained so as to leave the sub-grade dry, that it will not freeze and heave with frost. It is then thoroughly rolled. On this is placed 4 inches of rich concrete, which is surfaced with a coat of heavy asphaltic oil and sand about $\frac{3}{8}$ inch thick on top of that.

"This surfacing, according to the commission, costs 5 cents per square yard and can if necessary be renewed every year or so under the head of maintenance. This method of construction is likely to recommend itself in localities where a good road is required and funds are limited for this sort of work."



FRENCH COUNTRY HOME WITH GARAGE AT ONE END



TERRACE HOUSES WITH GARAGES ON FIRST FLOOR

The Motor Car Repair Shop

GUESSWORK in determining adjustments has led many men to believe that motor car engines require too much tinkering, but if they knew the use of the proper instruments for determining adjustments they soon would believe the gas engine to be as useful as it has proven to be to others. One of the most useful instruments for measuring small distances is known as the thickness gauge or feeler and although applicable to many places on an engine is not used by one-fourth of the owners of motor cars. At motor car factories the thickness gauge is as much of a necessity to the workmen as are the pliers.

The thickness gauge is a series of blades which vary in thickness from .002 inch to .025 inch or from .005 inch upwards, as the case may be. These blades are held in a case, as shown in Fig. 1 at 1, which appears just like a knife with many blades. Upon each blade is stamped its thickness, as the illustration shows. The end of the blade is rounded and it is this part which is used for measuring. If there is no blade marked .017 inch, let us say, then two blades whose sum equals .017 inch are used.

Motor car owners are told to adjust the breaker points of the magneto a certain way, so that the points when separated are .015 or .02 inch apart perhaps, but how many who make the adjustment use an instrument for measuring the distance? Very few. In the illustration on this page is shown the thickness gauge being used to measure the distance between the breaker points of a magneto. This is a delicate adjustment and should not be judged with the eye or a piece of paper. The blade should just touch both sides of the points. One can feel the sides touching.

Use of Thickness Gauge

Another use for the thickness gauge is in measuring backlash between gears. Backlash is the play or distance between two teeth which are in mesh. At motor car factories the motor gears are carefully measured with the thickness gauge, when a set has been placed in the motor. This is done as shown in Fig. 1 at 4. A screwdriver is forced between two teeth and then one gear is pushed up or down as far as possible, so as to take up all the play on one side. Then the blades of the gauge are slipped in between two teeth, as shown. If the factory decides that .03 inch is the proper distance and the gears show .04, no doubt they will be rejected, for such gears are liable to become noisy in a short time.

In adjusting valve tappets the gauge is very useful, although not entirely necessary. Some manufacturers will state that the intake valves of their motors should have a clearance of .015 inch and the exhaust .02 inch. No man can adjust valves to these figures and get them exactly as the manufacturer states. At some factories the clearances are measured with the motor running slowly. The blades of the gauge are slipped between the valve stem and tappet and if the blades may be slipped back and forth and just touch both parts, then the tappet is adjusted properly. Of course the blade will be tight when the valve is open.

Proper Material for Gaskets

Water, oil and air joints all require different types of gaskets and if the wrong gasket is used it may mean a leak in a short time. Take, for example, the joint made by the waterjacket cover and the cylinder of some motors. This is a joint

which should be carefully sealed. The proper gasket would be a piece of graphited asbestos cut from a sheet and then spread with shellac. Care should be taken when placing the shellac on both sides of the gasket to see that not too much is spread, for the excess may run into the jacket and cause trouble later. All water connections when treated with shellac will make a firmer and better joint. When used on rubber water hose the only trouble seems to be in getting the hose off when the shellac has hardened.

For sealing an oil joint, such as that made by the crankcase lower cover and the crankcase proper, a gasket made of wrapping paper has been found to answer the purpose very well. The best way to cut this gasket is to make a pencil outline around the cover, which has previously been placed on the paper, and then the gasket cut out with a knife. Another method consists in placing "dope" or heavy grease on the cover and then placing the paper over the grease. This holds the paper in place and then the sides of the cover may be tapped with a hammer, thus cutting out the gasket.

A piece of graphited asbestos is best for the carbureter manifold, as such material may be squeezed and makes a very tight and gas-proof joint. At the exhaust manifold the best gasket seems to be that of copper covered asbestos. This type is in almost universal use and the majority of supply stores carry a big stock of various sizes.

For all other joints requiring perfect sealing some compressible substance should be used. Asbestos in sheet form and covered with graphite has a great number of admirers, while thick paper is also used extensively.

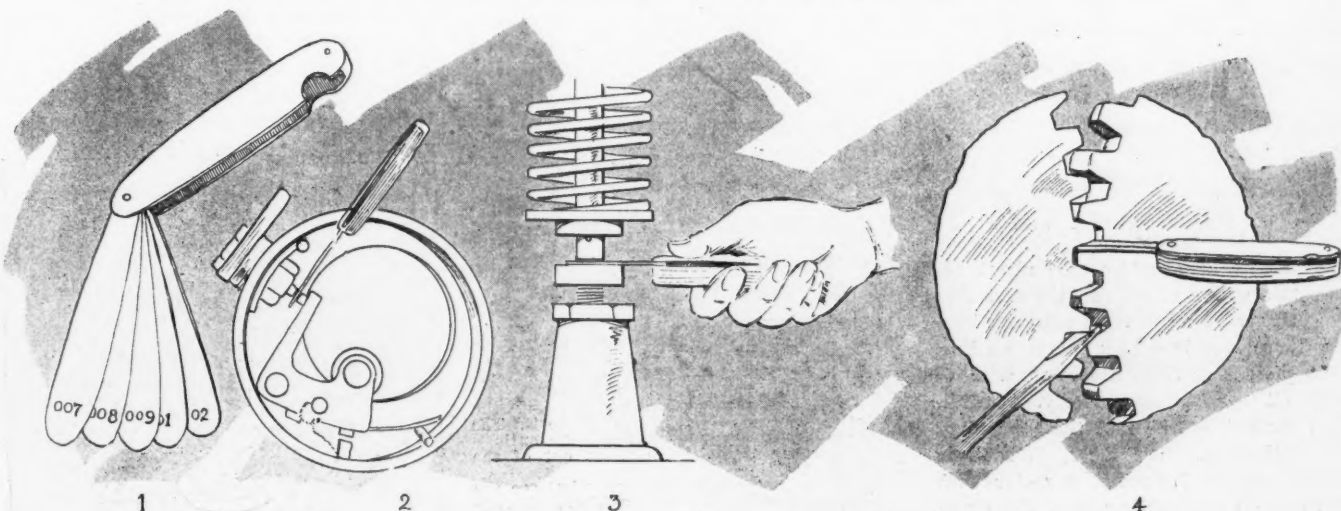


FIG. 1—SHOWING THE THICKNESS GAUGE AND SOME OF ITS USES

1—The usual form of thickness gauge or feelers; 2—Measuring the distance between magneto breaker points; 3—Obtaining accurate valve tappet adjustments; 4—Method of measuring gear backlash



The Readers' Clearing House



Questions Answered and Communications Received.

G. W. Norris.....Tracy, Minn.
E. M. Martinez.....Guadalajara, Mexico
C. T. Huston.....Sierra Madre, Cal.
C. Saelhof.....Chicago
J. L. Cook.....Springfield, Ill.
A. Kussman.....College Point, L. I.
W. I. Gilbert.....Dowagiac, Mich.
Frank V. Raymond.....Atlanta, Ga.
F. B. Burbank.....Sioux City, Ia.
A. K. Bell.....Madison, Ga.
C. H. Shaw, Jr.....Pittsfield, Ill.
E. Heath.....Elburn, Ill.
Henry Nurnburger.....Racine, Wis.
Subscriber.....Elkhart, Ind.
King H. Morse.....Oklahoma City, Okla.
E. O. Kroells.....Lindsay, Cal.
R. E. Nichols.....Kanapolis, Kan.
Leland Barter.....Maxwell, N. M.
J. G. Croutcup.....Nichols, Ia.

Cyclecar Section

S. H. G.....Chicago Heights
J. W. Davis.....Middleton, Tenn.
M. C. H.....New York

RELATION OF CAR TO MOTOR SPEED

Size of the Motor Has Nothing to do With the Performance.

TRACY, MINN.—Editor Motor Age—Will you give the r. p. m. of a 4½ by 5-inch, four-cylinder motor, geared 3.7 to 1 with a 34 by 4-inch tires at 20, 25, 30, 40 and 45 miles per hour?

2—How do these speeds compare with a four-cylinder 4 by 4½ motor, geared 3¼ to 1 with a 32 by 3½ tire?—G. W. Norris.

1—The motor dimensions have nothing whatever to do with the r. p. m. at a given car speed, etc. The following shows the r. p. m. at various car speeds with a 3.7 gear ratio and with 34 inch tires:

| | |
|-----------------------|----------------|
| At 20 miles per hour, | 750 r. p. m. |
| At 25 miles per hour, | 940 r. p. m. |
| At 30 miles per hour, | 1,125 r. p. m. |
| At 40 miles per hour, | 1,500 r. p. m. |
| At 45 miles per hour, | 1,690 r. p. m. |

2—With a gear ratio of 3.25 to 1 and 32-inch tires the results will be as follows:

| | |
|--|----------------|
| At 20 miles per hour the motor will turn over at | 700 r. p. m. |
| At 25 miles per hour, | 875 r. p. m. |
| At 30 miles per hour, | 1,050 r. p. m. |
| At 40 miles per hour, | 1,400 r. p. m. |
| At 45 miles per hour, | 1,575 r. p. m. |

MEXICAN'S E-M-F USES MUCH OIL

Leak in the Line or Worn Pistons and Rings Probable Causes

Guadalajara, Mexico—Editor Motor Age—How can I remedy the smoking of my E-M-F 30. I have to use 1 gallon of oil every 70 or 80 miles, which I think is too much. The spark plugs foul very often; the carbureter is all right; the oiler is of the vacuum type and I screw the filling plug tight with a good washer.—E. M. Martinez.

The E-M-F 30 should travel about 200 miles on a gallon of oil and the fact that you get only 80 miles from a gallon indicates that there is a leak in the oil line, or the pistons or rings are so worn as to permit oil to go by them freely. The latter is verified by the fact that the plugs foul continually. Sometimes, in fact, in the majority of instances, a motor with too much oil above the piston rings will miss at low motor speeds.

A hot motor will use more oil than a cold one and if the cylinders are carbon-

ized heavily it means that they will become hot and use more oil than previously. Motor Age suggests that you take the car on the road and note if its power on hills is below the average performance. If the motor knocks and overheats quickly, shows no inclination to pull a heavy load, it can be safely said that the cylinders are carbonized. It remains then to scrape the carbon.

Examine the oil line carefully for a leak. Remove the mud pan and drive the car over a clean dry spot on the road. Start the motor, let it run for five minutes and then shut it down. After the motor has been standing 1 hour, note if there is oil on the previously dry spot on the road. Sometimes the lower crankcase cover will leak oil, which drops to the mud pan unnoticed. If the crankcase does leak remove the cover and apply a new wrapping paper gasket and tighten all nuts well.

If it is decided that there is no carbon in the cylinders and no leak in the oil line, look to poor piston rings, or worn pistons.

VALVE-IN-HEAD TYPE POWERFUL Engineer Says It Is 20 Per Cent More Effective Than T-Head

Sierra Madre, Cal.—Editor Motor Age—All things being equal, which of the two motors would develop the most power—a four-cylinder four-cycle 4½-inch bore by 5-inch stroke, T-head motor, or an overhead-valve motor of the same size bore and stroke?

2—What is the bore and stroke of Blitzen Benz and Jay Eye See?—C. T. Huston.

1—Enrico Giovanni, chief engineer of the Fiat works at Turin, Italy, is quoted as saying that the valve-in-the-head motor gives as much as 20 per cent more power than a T-head of the same bore and stroke. Theoretically the valve in the head motor of the same design and dimensions will give more power than a T-head due to the combustion space being more nearly spherical than that of the T-head.

2—The Jay Eye See is 9¼ by 8½ inches bore and stroke; the Blitzen Benz 7.2835 by 7.8741 inches.

ADJUSTING TAPPET ON OVERLAND Means Provided for Quieting Motor—Norwalk Specifications.

Chicago—Editor Motor Age—Should there be any play in the rear wheels of a 1912 Overland, model 59-T? The wheels when jacked can be lifted ¼-inch up or down. Is this correct? If not, how can it be remedied?

2—Is there any method of silencing the valves of this car? I understand there is. The noise has grown very loud in the last month.

3—How can the play be taken out of the front wheels?

4—In the Norwalk underslung, what are the engine specifications? Give a short description of this car.—C. Saelhof.

1—There should be no play either up or down or sideways. The condition may be remedied by replacing the old bear-

ing with a new one, as in all probability, the excessive play is due to a worn bearing.

2—The valve tappets are adjustable by the common locknut and screw method as shown in Fig. 1. The noise is due to the clearance between tappet and valve stem being too great. This distance should be made as small as possible without interfering with the proper valve action. About 1-32-inch is the usual clearance. To adjust the valve first see that the valve is closed fully and then loosen the locknut, L by turning it to the left. Then raise the screw, S by turning to the left until an ordinary business card may be slipped between the tappet and the valve stem at C. With the proper clearance obtained hold the screw in place with one wrench and tighten the locknut with another wrench.

3—The front wheel bearings are of the cup-and-cone type and are adjustable. Remove the hub cap from the wheel and then back off the nut on the axle spindle. Turn the cone sufficiently to take up the play and at the same time leave the wheel free on its axis. If the cone is tightened too much, the wheel may not operate.

4—The Norwalk six appears in three chassis forms, two with a motor of 4.0 by 5.0 inches and the other with a 4.5 by 5.5-inch motor. The cars are essentially the same otherwise having single ignition Carter carbureter, and pressure gasoline feed. The wheelbase of the small sixes is 127 and 136 inches, while the big six has a 144-inch wheelbase. Optional steering location is given on the smaller cars, while the other is stock-equipped with right steer. A disk clutch is used on all chassis, the drive from there being through a three-speed selective gearset on the small cars and a four-speed on the larger model. All have a floating rear axle. All the cars propel through the springs.

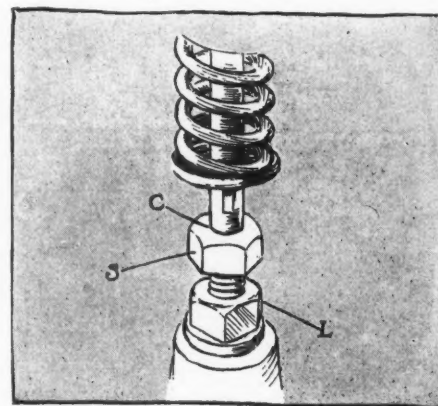


FIG. 1—METHOD OF ADJUSTING VALVE TAPPET

SPLITDORF LIGHTING SYSTEM DATA**Direct Current Generator—High-Tension and Lighting**

College Point, Long Island—Editor Motor Age—How can an alternating current magneto be distinguished from a direct, and which is better for ignition purposes?

2—Is there any high-tension magneto that can be used for lighting?

3—How do the Splitdorf people use this system?

4—Illustrate and explain the operation and principles of some prominent electric starter.

5—What is the latest S. A. E. horsepower formula?

6—Explain the principle of a low-tension magneto.—A. Kussman.

1—A direct current generator has incorporated with it a commutator. This appears in the form of a sectional copper ring at the end of the armature shaft. Pressing against this commutator are brushes which conduct the current away from the commutator. Thus the very fact that the machine has a commutator is evidence that it is a direct current generator. If a compass is held over one of the wires leading away from the magneto and the magneto is generating alternating current, the compass needle will fluctuate, the rapidity being dependent upon the frequency of the current in the wire. Both alternating and direct current machines are efficient for internal combustion engine work, but since the latter requires a vibrator for producing the effect of alternating current, which is the only kind which in its ordinary form may be raised to voltage, it may be said that the alternating current magneto is better for ordinary work.

2—High-tension magnetos will not do for lighting, for the voltage of the current as it comes from the magneto is too high for lamps. Low-tension magnetos generate about 6 volts, which is used for lighting. The voltage of the lamps will determine whether or not the magneto is suitable. If the lamps are of the 6-volt type and the magneto is a 6-volt generator, and of about 3 amperes capacity, it will operate two ordinary headlights. These consume about $1\frac{1}{2}$ amperes each. Low-tension magnetos are usually six-volt generators and most of them may be used for lighting, but the high-tension type producing at the distributor terminal something like 3,000 volts

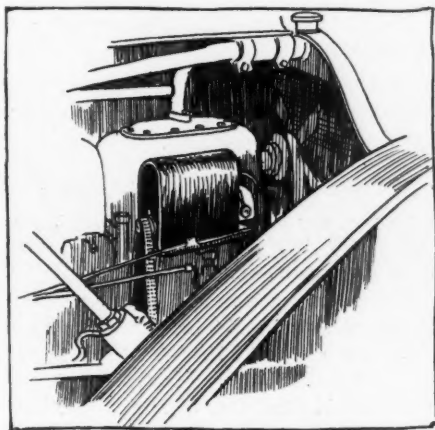


FIG. 2—SPLITDORFLITE GENERATOR AS INSTALLED IN A MOTOR

at a low current rate, could not be used for lighting.

3—The Splitdorf company is marketing a generator called the Splitdorflite, which is a direct current machine used for lighting and charging the battery. The generator is shown installed in a motor in Fig. 2 and the detail of the device exposed in Fig. 3. The generator is shown driven by silent chain from a motor shaft. The current is led from the instrument to a switch on the dash, which controls the different sets of lights. The generator is self-contained, having within it the cut-out mechanism. This is designed to automatically disconnect the machine from the lamps and battery when the voltage of the generator is the same as that of the battery. This prevents the battery from discharging back into the generator. Suitable fuses are installed in the system to prevent injury to the lamps and battery.

4—In Motor Age issue of January 30, the electric cranks on the market were described and illustrated.

5—The S. A. E. horsepower formula is

$$\text{horsepower} = \frac{D^2 N}{2.5} \quad \text{in which } D \text{ is the bore in inches and } N \text{ the number of cylinders.}$$

No doubt the formula which you mean is the modified S. A. E. formula

$$\text{which reads: } \text{horsepower} = \frac{D^2 N R S}{15,000}$$

In which D is the bore in inches, N, the number of cylinders, R, the revolutions per minute of the motor and S, the stroke in inches.

6—This is given in Motor Age issue of August 7, page 24.

U. S. SAME AS MORGAN & WRIGHT Consolidation Brought Four Concerns Together—Made in Two Cities

Dowagiac, Mich.—Editor Motor Age.—Inform me if Morgan and Wright nobby tread tires and United States nobby treads are made in the same factory. If not, where are the United States nobby treads manufactured?—W. I. Gilbert.

Since the consolidation of the Morgan & Wright Tire Co. with the G & J, Continental and Hartford to form the U. S. Tire Co., the nobby tread manufactured by the Morgan & Wright Co. has been renamed the U. S. nobby tread. This tire is made in two plants, one in Detroit, Mich., and the other in Indianapolis, Ind.

DIFFERENCE BETWEEN AXLE TYPES No Definite Opinion as to the Three-Quarters Floating

Atlanta, Ga.—Editor Motor Age.—Kindly explain the difference between a floating, semi-floating and three-quarter floating rear axle.—Frank V. Raymond.

This was explained fully in the Motorists' Kindergarten in Motor Age issue of July 10. There seems to be no definite opinion as to what a three-quarters floating axle is, some makers calling a semi-floating, by the name of three-

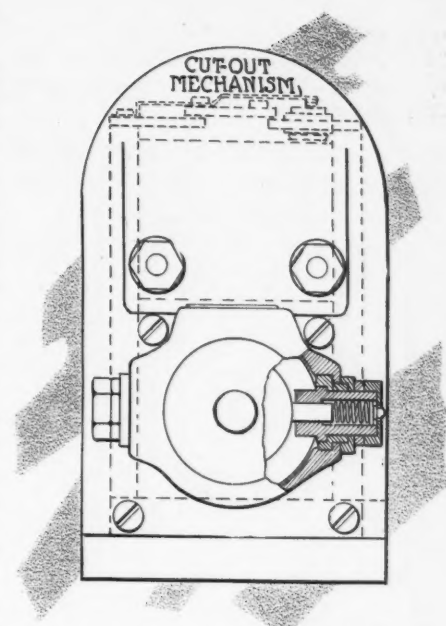


FIG. 3—DETAIL OF SPLITDORFLITE GENERATOR, SHOWING CUT-OUT

quarter floating. Other makers consider the three-quarter axle that which is permanently fastened at its outer end to the wheel hub and the floating that which is not fastened permanently.

ALCOHOL AS A CARBON REMOVER Other Methods Given—Scraping the Most Effective Way

Sioux City, Ia.—Editor Motor Age.—I should like very much to have some advice on removing carbon from the motor of my 1913 Cadillac. I understand that some engineer or chemist has found that denatured alcohol will do this, and should like the particulars of just exactly how it could be done, and what treatment the motor should have afterward. I presume also, that the alcohol should be put only in the two cylinders at a time, which have the valves closed.—F. B. Burbank.

Joseph A. Anglada, chairman Metropolitan section of the Society of Automobile Engineers, conducted a number of tests with denatured alcohol as a carbon remover and the results of these tests are set forth in a booklet issued by the U. S. Industrial Alcohol Co., New York. The experimenter tells us that the best results are obtained when the combustion space of a hot engine is filled entirely with denatured alcohol, and this permitted to soak for a period of not less than 6 hours. With a cold engine, the action is not as rapid as when heat is present. The booklet mentioned above may be obtained by writing the company.

Other methods are employed for removing carbon, the one most common being that of pouring kerosene into the cylinders of a hot engine and permitting the kerosene to soak over night. This tends to loosen the carbon which may blow out when the motor is started again in the morning. When the motor is first started the throttle should be opened wide and then closed suddenly, that is, race the motor intermittently until no black smoke appears at the exhaust.

The most effective way of ridding the

cylinders of carbon consists of scraping. The method and tools necessary for this operation was given in Motor Age, issue of March 6, page 36.

BUICK CAR MADE TO SAW WOOD Leather Belt from Rear Wheel to Circular Saw—One Man at Throttle

Madison, Ga.—Editor Motor Age—Kindly illustrate and explain how to arrange a Buick 30-horsepower to saw wood. Could it be arranged so one rear wheel will turn and the other rear remain stationary? How long and how wide should the belt or pulley be? How large a saw should I use and at what speed should I run the car?—A. K. Bell.

Fig. 5 shows how a Buick may be arranged to saw wood. Both rear wheels are jacked up and the tire removed from one of the wheels. A block is placed under one rear wheel as shown and the front wheel is blocked under so as to prevent the car moving off the jack. The belt should be about 8 feet long. The pulley on the circular saw should be about half the diameter of the wheel. One man should sit in the seat and operate the throttle, according as how fast the man at the saw can work.

TIMKEN AXLES MADE IN DETROIT Buick Company Part of the General Motors Corporation

Pittsfield, Ill.—Editor Motor Age—At what factories do they make Timken axles?

2—Do the Buick factories make any Timken axles or parts of Timken axles?

3—Where are the axles made which are used in the 1913 Cadillac; also other years' models?

4—Who controls or owns the Buick Motor Car Co.? Is it in a corporation like the U. S. Motor Co.?

5—What speed is possible in the Cadillac 1914 having a gear ratio of 2.5 to 1?—C. H. Shaw, Jr.

1—Timken axles are made at one plant and that is located in Detroit.

2—No.

3—Timken has made Cadillac axles for some years past. The company states that it makes and assembles the front and rear axles of Cadillac cars, with the exception of a few parts.

4—It is a corporation owned and controlled by the General Motors Corp.

5—Over 60 miles per hour.

Maxwell Motor Overheats

Elburn, Ill.—Editor Motor Age—I have a two-cylinder Maxwell roadster, Model A 1909, which will heat to the boiling point in a very short run. New cylinders have been put on, also an Atwater-Kent sparking system. The water line has been looked over and a new hose added. A queer thing about it is that sometimes it will run for miles at a full throttle of gas and not boil and other times will not run more than 1 mile. I have looked for everything that would cause it to heat, but can find no cause. The only possible cause I can find is a steam trap, how can that be overcome?—E. Heath.

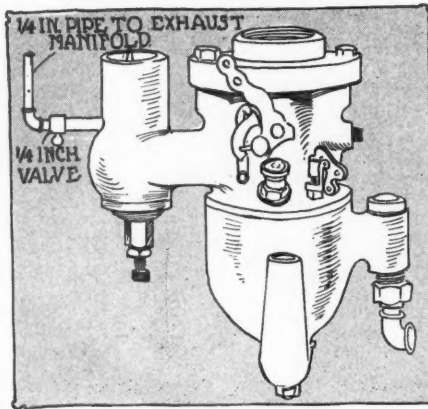


FIG. 4—READER'S CARBURETER ATTACHMENT

A steam trap would cause excessive heating. Motor Age suggested that you clean out the radiator thoroughly with washing soda dissolved in hot water. Two applications of this solution followed by three or four of clean water will help free the radiator of dirt. Then take off the water connections to the cylinders and clean them in the same way. With the water line clear, the heating may stop.

Sometimes a sticking valve will cause overheating by remaining open too long. The same result will be had if the valve is improperly adjusted. Look carefully over the intake and exhaust valves, and, if necessary, retune them. Lastly, do not carry the spark retarded too far and do not overfeed the cylinders with oil.

NOVEL CARBURETER ATTACHMENT Engine Starts Easier and Throttles Down Better Than Before

Racine, Wis.—Editor Motor Age—I have received many good pointers from the Clearing House and I have one myself which may be a help to some readers. I have a model 10 Buick of 1910 with a Schebler carbureter, and I never could get the engine to throttle down very slow. It was hard to start and the manifold always showed condensation. By attaching a hot-air pipe on the air intake it would heat up the carbureter too much in warm weather, so I drilled and tapped for a 1/4-inch pipe under the auxiliary air valve, as shown in Fig. 4, and placed a valve in the line and connected it up with the exhaust pipe. Now I can adjust the hot air as I desire, the engine starts delightfully easy, and I can run much slower than before.—Henry Nurnburger.

GEAR RATIO FIGURE IS CALCULATED

Motor's Dimensions Not a Determining Factor—Wheel and Tire Size

Elkhart, Ind.—Editor Motor Age—From the general design of the new cars what ought the differential gearing be in the car described herewith? The motor is 3 3/4 by 5 1/2, L-head, 2 inch valves, 37 by 4 1/2 inch tires on 36 inch wheels, four passenger body, the weight complete with extra tire and full equipment of 3,600 pounds.—Subscriber.

The gear ratio of a motor car is not made arbitrarily, but is determined by the maximum efficiency of the motor and the speed desired. The maximum efficiency is that point at which the car will operate at the lowest miles per gallons, fuel consumption. After the r. p. m. at the motor's maximum efficiency is determined the next thing is to decide at what speed the car should operate at the given motor speed and then the gear ratio adopted accordingly.

Let us suppose that the maximum efficiency of the motor is 1,000 r. p. m. Then to obtain a desired speed of, say, 30 miles per hour the gear ratio will have to be very nearly 3.7 to 1 with 37-inch tires. If a greater speed than 30 miles per hour is desired at this motor speed the gear ratio is made still lower.

You state that you wish to use 37 by 4 1/2-inch tires on 36-inch wheels. This is impossible, as a 37 by 4 1/2-inch tire takes a 28-inch wheel. The 37 by 4 1/2-inch tire is the oversize for a 36 by 4-inch tire and hence may be placed on the same sized wheel, namely a 28-inch. It should be remembered that the diameter of a tire is measured from the ground to the very top of the tire and not from bead to bead on the inside.

Speed of Thomas and Owen

Oklahoma City, Okla.—Editor Motor Age—What is the speed of the 6-40 Thomas Flyer 1910, model M, with 3 to 1 gear ratio and 36-inch wheels?

2—What is the gear ratio of this car in intermediate speed with same rear wheel ratio as above?

3—Will this car be built again by the party that bought the assets, etc.?

4—What is the speed of the 1911 Owen.—King H. Morse.

1—Although the car is manufactured no longer, performances have shown that this car is capable of making a speed of about 70 miles per hour.

2—The gear ratio on intermediate is not obtainable.

3—This is not known.

4—The Owen car was capable of traveling over 60 miles per hour.

Permanent Magnets for Magnetos

Lindsay, Cal.—Editor Motor Age—I am in need of some special magnets, but do not know where to get them. Also where can I have them magnetized?—E. O. Kroells.

Permanent magnets such as are used for magnetos may be obtained from Boker & Co., Duane street, New York; John A. Crowley Co., Liberty street, New York; and Krefeld Steel Co., Church street, New York. The magnets need not be magnetized, as they are ready for use when purchased.

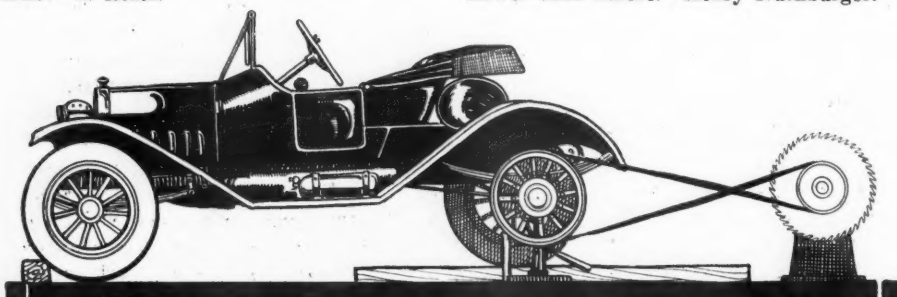


FIG. 5—HOW A BUICK MAY BE MADE TO SAW WOOD

TWO COILS FOR FOUR-CYLINDERS System Is Not Successful—Better to Run With Two Firing

Kanopolis, Kans.—Editor Motor Age—How can a motor car which has four vibrating coils be wired up to fire on all four cylinders, in case two or three of the coils should burn out?—R. E. Nichols.

Two unit coils have been used on a four-cylinder motor but with little success, the experiment being tried by a number of owners, who came to the conclusion that running in on two cylinders was better than rewiring, in which case the motor may or may not operate. The method consists in taking wires 1 and 2 from the timer and attaching them to one coil and wires 3 and 4 to another coil. The high-tension wire from the coil to

which wires 1 and 2 are attached, is then led to cylinders 1 and 2, the wire being connected in series with the plugs. The high-tension wire from the other coil is led to plugs 3 and 4 in the same way. This system may or may not work according to resistance offered by the plug and the line. It is expected that both plugs will spark, one on the exhaust stroke of the piston and the other at the proper time. In most instances the motor will not operate at all, due to this arrangement.

Mercedes Tires Were Stock

Maxwell, New Mexico—Editor Motor Age—Were the Braender tires, used by Ralph Mulford in this year's Indianapolis speedway races, stock tires?

2—What is required of car owners to be-

come a member of the American Automobile Association?—Leland Barter.

1—They were stock, according to the maker's statement.

2—Anyone of suitable character may become nominated for membership.

To Clean a Clogged Radiator

Nichols, Ia.—Editor Motor Age—How can I clean the radiator in my Chalmers car of oat meal? The radiator had a small leak and the repair men put in some oatmeal, stopping all circulation. I have had it cleaned several times, once by forcing steam through and several times by forcing water pressure. This helps for a short time but the circulation is still poor and the motor heats.—J. G. Croutcup.

Try washing soda dissolved in hot water. Make the solution a strong one, and after flushing the radiator with it a few times try clear hot water. Do the same with the cylinders.

Readers Criticize Construction of American Cyclecars

WHY A 36-INCH CYCLECAR TREAD?

Cars of Off-Standard Gauge May Travel
Country Roads Safely

CHICAGO HEIGHTS, ILL.—Editor Motor Age—Your articles on cyclecars are read with great interest, but why do you mention a tread or gauge of 36 inches? A car with that gauge might operate successfully upon a smooth surface like your Michigan boulevard, etc., but do you seriously consider a gauge of 36 inches can be used satisfactorily in the country districts? Is it likely that any other gauge than the 56-inch standard would do? I wish to learn the relative advantages and disadvantages of each.—S. H. J.

To answer your last question, first, we do think that other than the standard, 56-inch tread will do. The 36-inch tread originated in theory but has since proved out in practice, and has been adopted by the greater number of announced cyclecar manufacturers.

The reason for the 36-inch tread has been explained previously in Motor Age. If one makes a near-standard gauge, say 40 inches or thereabouts, then in running on a country road one wheel will have to be in a rut all the time. If you steer it out the other drops in the other rut. With the 36-inch tread one can run between these ruts without hitting either unless they be very wide, when it will be no disadvantage to get into them.

Many main-traveled roads have two series of ruts, car and horse ruts. The horse and wagon ruts occupy the main road, the horse track being in the exact center, the wheel tracks at the side. This is the state of roads where there is little motor traffic. When motors come they run very often with one wheel in the central horse track and the other in a new path at the side. This leaves a new series of wide ruts, and a 36-inch tread car on this kind of road has a number of rut pairs to choose from which may fit the tread or gauge; between the left motor car track and the wagon wheel track, between this and the horse track, and the same on the other side of the road, making at least four tracks to choose from.

The proof of the pudding, however, lies in the fact that the cars so far tested with this tread have been able to make

as good time over bad roads as the big cars and, it is claimed, with as great a degree of comfort. The writer has covered 50 miles of rough road on a 36-inch tread car at a speed and with a comfort not enjoyed in big cars on the same road at much less speed. Motor Age is in receipt of letters from firms which have built to the 36-inch width on the arguments presented in this department, speaking very enthusiastically of the results.

Since a large per cent of cyclecars will be of 36-inch tread it will take but a year or two before they will be making their own ruts and roads out of our cities, the number of the new vehicles leading to even more widely spread good roads movements until the day comes, as is now in England, when the matter of tread does not count, for there are no ruts.

With the narrow cyclecar less power is used for driving, steering is much easier, there is less side swing, a motor-cycle motor can drive it, its transmission can be simple, and first cost very low.

CYCLECARS HERE AND ABROAD United States Has Almost Twenty Makers of Such Vehicles

Middleton, Tenn.—Editor Motor Age.—Kindly send me circulars of the small, narrow, four-wheel car, called cyclecar, that is being built in the United States, France and England.—J. W. Davis.

Motor Age has no circulars, but refers you to the following concerns in America and Europe, manufacturing cyclecars: Imp Cyclecar Co., Auburn, Ind.; American Cy-

clecar Co., Equity Bldg., Detroit, Mich.; Woods Autoette Co., Chicago; Carlson-Wenstrom Mfg. Co., Philadelphia, Pa.; American Voiturette Co., Detroit, Mich., and the California Cyclecar Co., Los Angeles, Cal.

The prominent European manufacturers are Bedelia Cyclecar Co., 32 Rue Felicien-David, Paris, France; H. E. Dew, Lullington Castle, Kent, England; Humber, Ltd., Coventry, Eng.; Morgan Motor Co., Malvern, Eng.

SPRING SUSPENSION NOT FAULTY Found in Practice to Cause No Tire Scraping—Tire Pivots

New York—Editor Motor Age—Referring to Fig. 8, which shows the rear suspension of the Imp cyclecar, described in Motor Age a few weeks ago, will the wheels not spraddle out when the springs act, thereby setting up terrific strains on them? Will the track not waver, thereby wearing the tires abnormally?—M. C. H.

Your criticism of the Imp spring system is true in theory, but negligible in practice. The springs used are flat or nearly so, and their movement on the road up and down makes an end movement of less than 1/8-inch maximum. By special spacing of the springs the wheel instead of spreading 1/8-inch altogether is fixed so that it spreads about 1/4 inch at the top and not at all where it is in contact with the road surface so that there will be no rubbing of the tire across the ground.

If what you say were true the rigid rod connecting the steering arms would cause the wheels to move toward each other in front and back when the car ran over bumps. As a matter of fact at the highest speeds on the roughest roads no such movement is noticeable except on big bumps and then it is so small as to be negligible. This car has been driven at 50 miles per hour on rough roads, averaging 30 miles per hour on a 20-mile country trip and with a degree of comfort equal to that in a big car. And further, an inspection of the tires after the run showed that there was no scraping between them and the road.

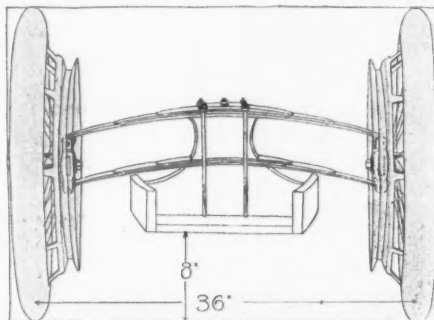
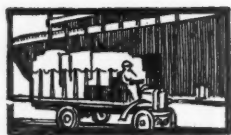
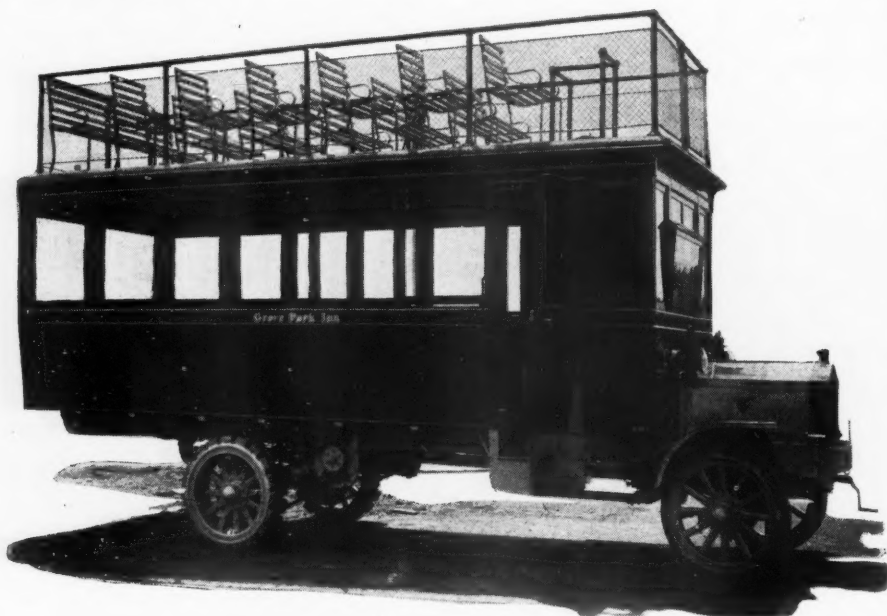


FIG. 8—SPRING SUSPENSION OF IMP CAR,
WHICH READER SAYS IS FAULTY



The Realm of The Commercial Car



MOTOR BUS IN USE IN ASHEVILLE, N. C.

Delivery and the High Cost of Living

CHICAGO delivery conditions are at such a state that the daily papers have been taking up delivery problems and handling them on the front page; the stories dealing with every line from grocery deliveries to freight terminal problems.

One of the first articles was one by Henry M. Hyde in the Chicago Tribune. This dealt with the influence of bad roads on Chicago prices.

"Chicago is the second biggest market for food products in the United States," starts the article, "yet within the last year a good many tons of root crops, onions, carrots, parsnips, beets, rutabagas, turnips, which were raised on farms not more than 20 miles from the city hall have been dumped into holes and gulleys. How, with everybody complaining of the cost of living, can there be any possible excuse or explanation for such an apparently criminal and reckless waste?"

"The average housewife knows that she pays from 2 to 5 cents a pound for all these vegetables. That is at the rate of from \$40 to \$100 a ton.

"Cutting that figure in two to allow 100 per cent profit for the middleman and retailer, the truck farmer should get from \$20 to \$25 a ton for all his produce. . . . Is the Cook county farmer so rich that he can afford to fill his mudholes with material worth \$20 a ton? Or is he simply a fool?"

Many figures follow on the opportunities of a county containing 2,000,000 people within walking distance of the farms, con-

taining 5,000 farmers and truck gardeners, fewer than half belonging to a union organization known as the Cook County Truck Gardeners and Farmers' Association.

As a matter of fact root crops are bought from Cook county farmers for from \$5 to \$7 per ton. "Somewhere between the producer and the consumer's kitchen," continues the story, "from 700 to 1,200 per cent has been added to the cost. . . . Before the farmer can get even \$7 a ton for his stuff he must deliver it in Chicago. That means he must load his wagon in the afternoon, spend all night in driving from 15 to 18 miles and in selling his produce and then in the morning drive back his empty wagon to the farm. Each trip takes 24 hours spent without a chance to sleep. This also helps to explain why it is hard to get reliable and efficient farm help in Cook county."

Add to these the fact that the hauls are made over roads full of mud holes, ruts, sand and stones, straining a team to its utmost to haul a load which would be considered small in the paved city, and it will be easily seen why roots and vegetables rot in Cook county while the same stuff is shipped in by railway from 100 mile distant farms for the housewife to pay big prices for.

Of thirty highways entering Chicago eight carry the main traffic, not one of which is anywhere near good repair for any considerable proportion of its length. For several weeks every year all these are in an almost impassable condition.

Illinois as a state ranks first in agriculture, third in wealth of its inhabitants and twenty-fourth in the percentage of its improved roads. The people of Illinois are taxed \$7,000,000 a year for roads and road maintenance, New York being the only other state that spends as much. The farmers pay \$400,000 of this road tax, and more than half is wasted.

Such is the substance of the article, pointing to the cost, to the state, of bad roads and the effect on living cost. It is a pleasant thought that the conditions are to be bettered at once by new legislation already passed on by the legislature.

The Chicago Record-Herald on July 26 contained another phase of the delivery cost situation, this time reflecting some of the blame for high cost on the housewife. Elliott Flower discusses the housewife—Mrs. Flutter—as follows:

"Mrs. Cornelius Flutter lives in an aristocratic Chicago suburb. She has a wealthy husband and an establishment that is quite pretentious for the suburb, although it might not be counted much on Lake Shore drive. She has her own social and club interests which occupy much of her time, and it will be evident from this story that her household is not well organized. Therefore we get an item of the increased cost of living.

"Mrs. Flutter's cook needed some things from the grocer's such as flour and breakfast food, and a few vegetables, so she telephoned for them and the grocer delivered them.

"Mrs. Flutter's maid discovered that she needed some cleansing preparation for her work, so she telephoned, and the grocer delivered it. Mrs. Flutter herself then invaded the kitchen and decided that there were some things needed, so she telephoned, and the grocer delivered them. Then the cook discovered that she had forgotten something, so she telephoned, and the grocer delivered it.

"The second maid discovered the need of something for which she telephoned, and the garage man decided that he had need of a metal polish that the grocer could supply, so they telephoned. One of the grocer's wagons made two more trips to get these things to Mrs. Flutter.

"Unexpected company for luncheon made Mrs. Flutter feel that it was incumbent upon her to get a few table luxuries in the vegetable line and a rush order went to the grocer over the telephone, and again he delivered the goods.

"The grocer says he made twelve trips to Mrs. Flutter's house that day, and deliveries cost money. Mrs. Flutter did not pay for them. If she had there would be no cause for complaint. They were entered up against the general cost of living

and that cost was divided up among all the patrons of the store. It had to be, or the grocer could not continue business.

"Yet the cost of delivery is not the main item of expense in doing this retail business. More clerks are necessary than ever before, and they demand higher wages. The wage increase has been 33 1/3 per cent, and the telephone has had its effect in increasing the number employed."

Such is another condition discussed, and affecting the high cost of living, and, if the facts were known, the carrying of goods from the market to the user with all of this increased service caused very largely by the carelessness of the housewife in ordering, and the groceryman in his system, may contain the disease which is eating away profits, keeping costs up and men down.

A little scientific management between farm and consumer, and the grocer and consumer as well, would clear out a lot of waste and add a lot of profit, while a little educational campaign by grocer's associations in small communities would help educate the housewife to the importance of ordering her home affairs to her own interests and the grocer's by eliminating the extra rush trips as far as possible.

GUESTS TRAVEL IN STYLE

Two Packard passenger cars, fashioned along the lines of such cars used in Paris, are now in use by Grove Park inn, located on the western slope of Sunset mountain, Asheville, N. C., for transporting passengers from the railway station to the inn, nearly 4 miles away. The bodies were designed by Fred L. Seely, who also was architect of the inn, and are 16 feet long, 7 feet wide, with entrance on right side immediately back of the driver's seat. The stairway to the top is from the inside and the cars are upholstered with leather and lighted by electricity. There are twenty chairs in the car and twelve seats on top. The chairs in the car are not fastened to the floor or wall, and may be moved about at will.

The bodies were made in Atlanta by the Karwisch Wagon Co., and mounted on Packard trucks of 144-inch wheelbase

shipped from the Packard factory to Atlanta. These cars are provided with coupling device just under rear of body for hauling rubber-tired trailers carrying baggage for guests of the inn. These cars were so large that the Southern

Railway searched the country to get freight cars large enough in which to ship them to Asheville. A bugler uniformed in silver grey serge accompanies the cars on their trips to and from the station.

Modern Milk Wagon in Motorized Form

IMPROVED methods of hauling dairy products have resulted in corresponding improvement in the manner of caring for the loads while in transit. Progressive milk and creamery companies have kept pace with other lines of business in the adoption of motor truck delivery and there has been an interesting evolution in body development along lines that promote purity of the product, refrigeration of the load and convenience of access.

The familiar sight of the milkman dropping the reins and reaching for bottles among baskets exposed to dirt and contamination, soon will disappear. At least it is a thing of the past with the Aines

Barn Dairy of Kansas City, Mo., which uses White motor trucks and which has developed a refrigerator milk body in which the certified supply is not only protected against foreign matter and temperature changes but it is contained in compartments which allow access to one part of the load without opening or exposing any other part.

An exterior view of the body gives no suggestion of the great precaution to insure cleanliness and a cool supply. The truck resembles a standard 1500-pound panel delivery except for side doors that are built about midway of the body. Even when one of these doors is opened the protective feature is not readily recognized because the doors open to an aisle or vestibule built transversely of the body.

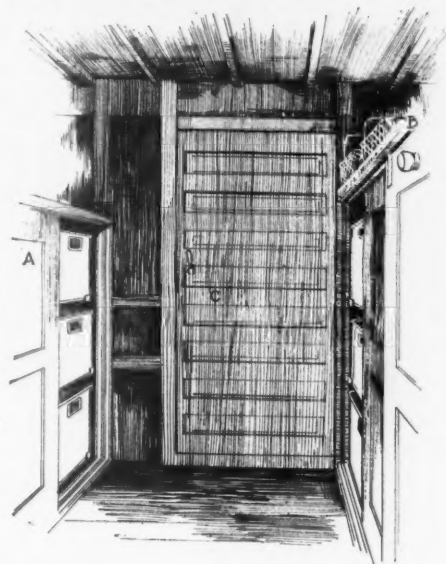
Between the vestibule and a partition in back of the driver's seat, there is built a series of compartments with sliding doors that are practically air-tight and each compartment has three tiers of sheet-metal trays that slide in and out like the drawers of a desk. Nine of these trays are carried forward of the vestibule and twenty-four are carried in the rear section. With this arrangement the driver can get at the particular tray that is needed while the others remain in complete protection.

Between each compartment and the roof, there is at least 2 feet of space which gives room for carrying the wire baskets that are used in deliveries to dwellings, besides furnishing an opportunity for ventilation above the compartments. Between the bottom trays and the floor of the truck there are drip pans and space has been allowed for thorough flushing and scrubbing. The entire body, as well as the interior of the compartments, is double lined to maintain uniform temperature and guard against heat reaching the supply.

RIG FOR UNDERTAKERS

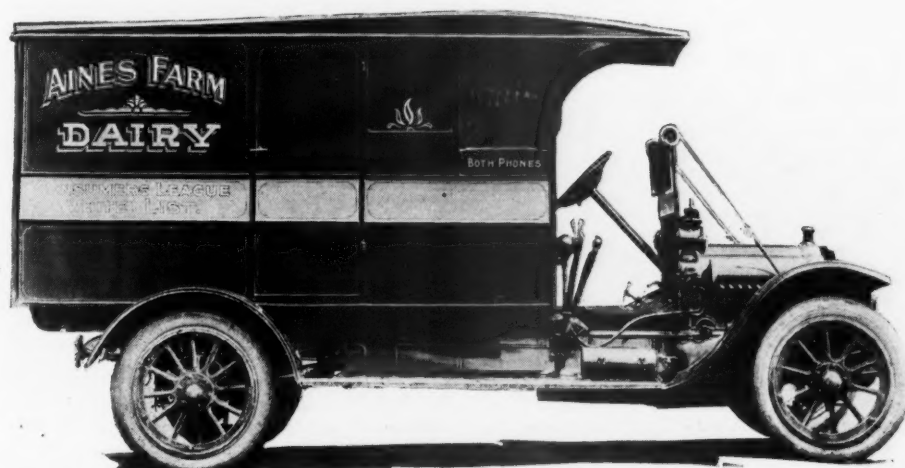
A company known as the La Bell Funeral Motor Car Co. has been organized in Detroit for the purpose of putting out a funeral car and conducting funeral services. The car body is a subject of a patent issued to Mr. La Bell. The design calls for a compartment for the casket and flowers and other compartments running crosswise of the car, which will accommodate thirty mourners and six pallbearers. This funeral car can be built upon any of the standard truck chassis.

It is planned by the new company to build these cars for sale throughout the country.



INTERIOR OF MILK WAGON

A, sheet metal trays for milk bottles
B, wire trays for carrying purposes
C, door through which driver reaches his milk supply



MOTOR TRUCK FOR CARRYING DAIRY PRODUCTS

Good Roads Brevities

IT IS probable that the first opportunity of the women to vote in Kane county, Ill., will be upon a proposition to issue bonds of \$200,000 for the purpose of constructing state aid roads. The voters must agree to a bond issue or the county cannot receive money from the state.

Representatives from several Kansas and Colorado cities along the proposed route of the Midland trail met at Denver recently and prepared a petition to the federal government for the services of two or three army engineers to help determine the most feasible motor highway through Colorado.

State Highway Commissioner Bennett of Connecticut has introduced an innovation in that all the road supervisors are to meet frequently for the discussion of road repair work. The plan is to have a conference of the road officials once a month. These will be held throughout the state. It is expected that the plan will be prolific of good results.

The hard roads now under construction in Wysox township, Carroll county, Ill., are at the expense of the township and not the state. There are 5½ miles already completed and 10 more under contract. The total cost will be \$35,000, bonds being issued to pay the bill. Gravel and crushed stone are being used with an 8-inch fill. The width is 10 feet.

It is now an assured fact that Secretary of State Bryan and Secretary of Agriculture Houston, will be President Wilson's representatives at the opening of the American road congress at Detroit, September 29.

Work on Washington's state highway system, authorized by the last legislature, is beginning to assume definite shape and indications are that a large portion of the work done this year will be in southwestern Washington. The sum of \$119,264 has been appropriated for work on the Pacific highway between Vancouver, Wash., and Pierce county. The Olympia peninsula highway will be built north to Humtulsips, an agreement having been reached whereby the Chelalis county commissioners will build a new road from Hoquiam to Humtulsips. Twenty-five convicts have been put to work on the Hood's canal road, for which \$111,000 has been appropriated.

Mayor Henry W. Klein of St. Louis has been chosen president of an organization formed to obtain for St. Louis the permanent headquarters of the United States Good Roads Association, which will hold its annual convention in St. Louis in November. Thomas L. Cannon, member of the executive committee of the association, said that at the last meeting of the body in Birmingham, Ala., it was voted to incorporate under the laws of Missouri. So far, however, no such action has been taken. It is estimated that 25,000 persons will attend this year's meeting. Governors of thirty-one states also have signified their intentions of attending.

The old Barlow toll road, the only through route from Portland to eastern Oregon, will be opened to travel during the next 2 weeks. Thanks to the public spiritness of E. Henry Wemme, the road which runs through the Oregon forest reserve is being put in condition for motor cars. The work has been done at Mr. Wemme's own expense, following his purchase of the road last spring for \$6,000. During the summer, tolls will be charged motoring parties traversing the road and the money will immediately be put back in highway construction. Mr. Wemme has offered to give the government this road, provided it is made a free public highway and is kept in repair by the United States forestry service.



BUSINESS MEN AS GOOD ROADS MAKERS

BUSINESS men of Pueblo, Colo., interested in the Rainbow route, which begins at Pueblo, recently demonstrated that they practice what they preach by turning out and working themselves on the road. The Rainbow route is claimed to be the shortest way to Salt Lake City and is declared to be the only road across the Rockies that is open at all seasons of the year. The Santa Fe route also runs into Pueblo

PULMOTOR on Motor Patrol—A new motor patrol wagon purchased by the police department of Canton, O., is equipped with a pulmotor for the purpose of resuscitating persons drowning, electrocuted or asphyxiated.

Hauls Oats with Motor Car—W. C. Coplin, a farmer of Breckenridge, Ill., pulled 100 bushels of oats to market last week with his motor car which he coupled to the oats wagon and hauled it 4½ miles, making far better time than a team of horses. The weight of the oats was 4,500 pounds.

Welcome for Hoosier Tourists—Motor enthusiasts of Indianapolis told those who participated in the Indiana-Pacific tour how glad they were to see them home safely, on August 23, when a beefsteak dinner was served. During the dinner there was a cabaret performance and later lantern slides and moving pictures of the tour were shown.

Garage Sprinkler Checks Fire—By having its garage equipped with a sprinkler system, the Barnett Lumber Co., of Birmingham, Ala., prevented what might have been a disastrous fire. Gasoline caught fire while one of the trucks of the company was being filled. The protective equipment in the garage held the flames in check until an engine arrived, when the blaze was extinguished quickly.

Pope Memorial Is Finished—The Pope memorial fountain at the entrance of Pope park in Hartford, Conn., is completed and the dedication is to take place in September. The memorial is to commemorate the efforts of the late Colonel Albert L. Pope in the interest of good roads. It is over 16 feet high and stands on a granite platform about 12 feet wide raised a step above the ground. The design comprises a round memorial pillar bearing on its face towards Capitol avenue and within sight of the Pope shops a bronze likeness of Colonel Pope. At the base is a large horse watering trough hewn from solid stone. The water spouts from an antique lion's head into the basin

and a dog's head conveys the water from the trough into a shallow basin near the ground. What is now Pope park was formerly ground owned by the Popes and donated to the city for park purposes.

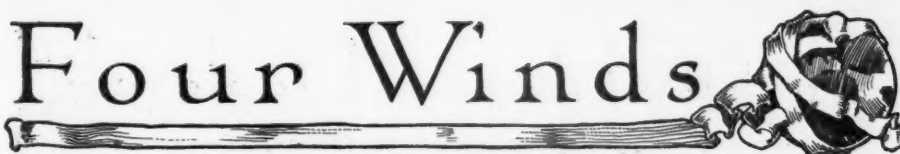
Fargo Motor Law Strict—The new motor ordinance of Fargo, N. D., forbids persons under 16 years of age to drive within the city limits, requires registration of the state license number with the city auditor, provides a 10-mile speed limit and 7½ miles on crossings and reduction of brilliancy of headlights in the city.

No Spring Show in St. Louis—That spring motor shows in St. Louis are things of the past was made certain this week when the Coliseum management announced that it would not rent its building for show purposes. This year's annual show will be held at Forest Park Highlands, where 93,000 square feet of space have been set aside for the exhibitors.

Motor Patrols Good Investment—Police Commissioner Gillespie has put six Ford runabouts in the Detroit police department service. He expects to save the city about \$10,000 a year by using these light cars for all public work except the transfer of culprits and emergency calls. The new arrangement will undoubtedly cut down the figure of 160,000 miles covered by the motor patrols and heavy machines last year.

Stearns in Long Trip—Fourteen days were consumed by H. N. Scholl in a motor trip from New York to New Orleans recently. Much faster time could have been made, but the journey was made in easy stages and a complete log kept. Mr. Scholl used a 1912 Stearns in which he has covered 150,000 miles in the past year. The national road was followed from New York to Atlanta. From Atlanta to Birmingham the trip was made over the recently completed route connecting the Georgia and Alabama cities. It took 6 days and 30 hours to reach Birmingham, and practically the same time was required for the much shorter end of the trip to New Orleans. At the Pearl river,

Four Winds



Copyright 1913, Elgin Photo Supply Co.

ELGIN CITIZENS WORK ON THE HIGHWAY

ANTICIPATING a heavy motor traffic at the time of the Elgin road races, scheduled for August 29-30, members of the Elgin Motor Club recently turned out to fix a bad hill on the north road from Chicago which the highway commissioners had refused to repair. Nearly 100 enthusiasts spent the day removing stones and otherwise making the hill fit for driving over

the boundary between Mississippi and Louisiana, it was necessary to go 200 miles out of the way in order to find a ferry boat large enough to handle the car.

Car Display at State Fair—Considerable space has been taken in the machinery building at the Ohio state fair grounds at Columbus, O., for display of motor cars. The display will consist of both Columbus agencies and manufacturers. One of the features of the exhibit will be the display of motor trucks and delivery wagons.

Call It "The Lincoln Way"—While it is known as the Lincoln highway officially and according to the articles of incorporation, Henry B. Joy, president of the Lincoln Highway Association, has christened this patriotic undertaking "the Lincoln way," and this name may be finally adopted for the coast-to-coast cement road. The title the Lincoln way has been copyrighted.

To Safeguard Colorado Roads—A move to have all dangerous points on Colorado roads amply protected by retaining walls or other needed safety equipment will probably be started soon, as a result of a letter just received in Denver from Carl G. Fisher, president of the Ocean-to-Ocean Highway Association, charging lack of such protection responsible for eighteen deaths from motor car accidents in western states this summer.

Motor Cars for Mounted Police—The question of providing police subdivisions in western Canada with motor cars is being discussed by the department at Ottawa. It is reported to be the intention of the department to procure two motor cars for each of the nine districts or divisions of mounted police in the northwest, the cars to cost in the neighborhood of \$3,000 each. Nearly all of the districts consist of two sub-districts and one machine will be allotted to the headquarters of each subdivision. It is believed that more efficient and better work can be accomplished by the mounted police with motor cars than with horses. It is

proposed to purchase about twenty Cadillac cars of the touring class, but especially designed for police work and equipped with straps and other devices with which a prisoner may be secured.

Templar Conclave Attracts Motorists—The Denver Motor Club estimates that 3,000 visiting motor cars were brought to Denver by the Knights Templar conclave. The club maintained a welcoming and information tent, assisted the visitors in securing garage accommodations and provided other features of hospitality.

Ohio Second in Motor Cars—State Registrar of Motor Cars Shearer of Ohio is authority for the statement that Ohio is the second state in the union in the number of motor vehicles registered. When the 80,000 mark was passed in Ohio, Registrar Shearer wrote to the registrars of other states to ascertain their number of licenses. He found that New York had 117,509 vehicles registered; Ohio, 80,375; Illinois, 79,439, and Pennsylvania, 71,419. California, with a nominal registration of 112,129, counts all cars that have ever been registered in the state and also counts hundreds of tourists' machines which have been temporarily listed in the state.

Delivery Trucks Are Popular—That the horse is losing ground to the motor cars in the St. Louis delivery business was shown by a canvass of the department stores last week. The Grand Leader uses thirteen gasoline trucks and two electrics. The Famous-Barr Co. operates four gasoline trucks and uses two electrics in hauling its patrons to and from the railway station. The Scruggs-Vandervoort and Barney Corp. has eight trucks in its garage, four being gasoline and the balance electric cars. Nugents have three trucks, two of which are gasoline and the other is an electric. The local delivery fleet is composed of eight 1,500-pound and six 1-ton trucks, twelve 2-tonners and six of the 3-ton size.

Recent Club Activities

THE Automobile Club of Hartford has earned the gratitude of all motorists in the issuance of weekly bulletins of road conditions throughout the state of Connecticut. The information is especially useful to tourists who pass through Hartford.

In order to make arrangements for the starting of the work on the Meridian to Vicksburg highway, the Mississippi Good Roads Association has called a special meeting at Meridian for August 26. The new road will go via Jackson, the state capital.

The Toledo Automobile Club was organized last Friday evening. The new club will be affiliated with the Ohio State Automobile Association. The officers of the new organization are: President, Isaac Kinsey; secretary, Royal R. Scott, and treasurer, Harry M. Bash.

A new motor club has been organized in Indianapolis under the name of the Auto Inn Club and has been incorporated under the Indiana voluntary association act, without capital stock. The club has leased a residence formerly occupied by James A. Allison and the old Prest-O-Lite plant, south of Indianapolis.

The incorporation papers of the newly organized Peoria Automobile Club of Peoria, Ill., were filed last week, the incorporators being Henry C. Roberts, Stephen K. Hatfield and Samuel L. Nelson. Administration of the affairs of the club will be vested in a board of nine directors. Next spring a \$20,000 club house will be erected.

A large number of motor car owners in Sandusky county met at Fremont, O., recently and organized the Fremont Automobile Club. Temporary officers were selected.

T. P. Beard has been appointed secretary of the Wolverine Automobile Club to succeed Fred M. Randell, who has become treasurer following the resignation of Leonard Davis.

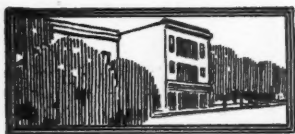
Motorists of Ozaukee county, Wisconsin, of which Port Washington is the seat, have organized a county motor club under the name of Ozaukee County Automobile Association. The officers are: President, George Blessing; vice-president, Dr. W. C. Coerper; treasurer, W. B. Ramsey; secretary, W. B. Krause. The membership committee already second state in the union in the number of has more than 150 applications.

Several motor car owners of Pilot Mound, Man., and the municipality of Louise met recently to consider the advisability of forming a motor club, with the view of co-operating with the council for better roads and especially for quick repairs of almost impassable culverts. It was decided to form a club known as the Pilot Mount-Louise Automobile Club. Officers were elected as follows: President, Dr. R. D. Ferguson; vice-president, John M. Donald; secretary-treasurer, W. A. Elliott.

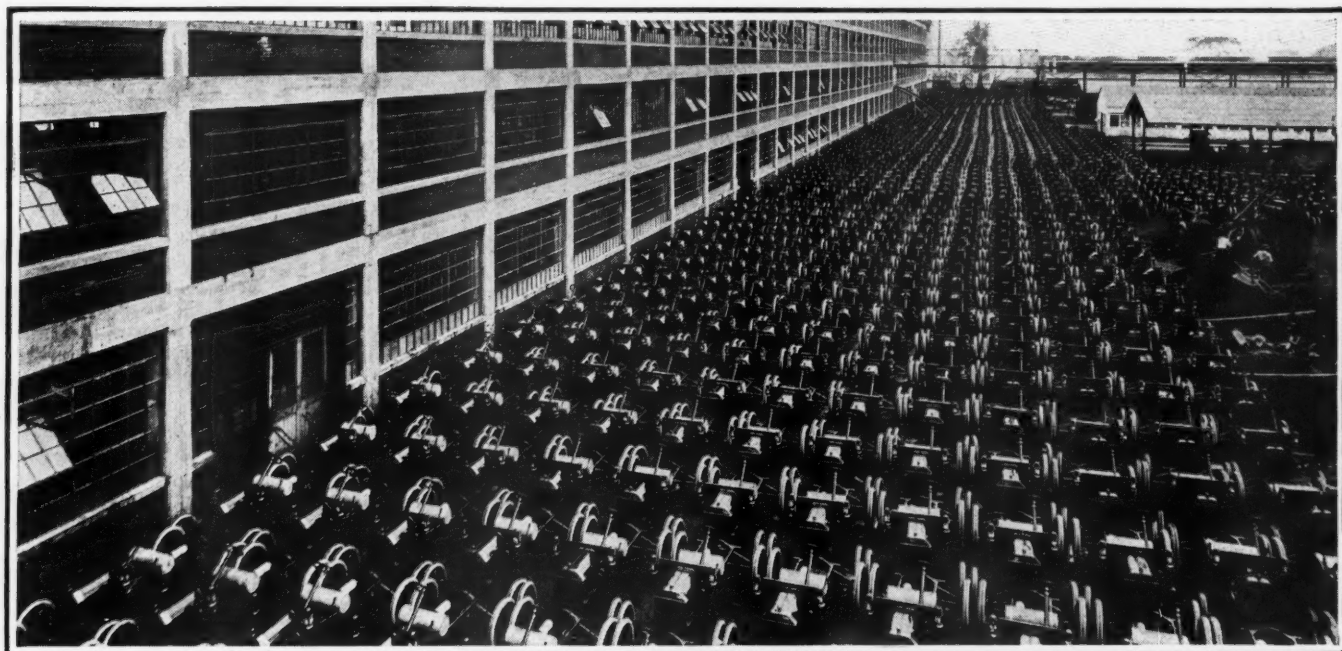
The Sheboygan Automobile Club of Sheboygan, Wis., which early this year intended to raise \$50,000 for the construction of 5 miles of concrete parkway between Sheboygan and Sheboygan Falls, later abandoning the idea, has carried out a plan which provides county and state funds for macadamizing the original highway early in 1914. The club will contribute several thousand dollars, which, under the Wisconsin state aid highway law, requires the townships and county to make appropriations, which are then duplicated by the state.

Olympia, Wash., now has a full-fledged motor club, with C. J. Lord as president and W. L. Bridgford as secretary. Over 200 members have thus far joined the club.

Jesse Taylor of Jamestown, Ohio, editor of Good Roads, the official publication of the Ohio Good Roads Federation, has been elected general secretary of the National Highways Association at Washington, D. C.



Among the Makers and Dealers



ONE thousand motor cars, rolling on pneumatic tread down a metropolitan boulevard, is rather a commonplace sight. One thousand motor cars, parked in green pastures on the edge of a roaring road race course, is something in the nature of a spectacle. But 1,000 motor cars, assembled for shipment and representing but a single day's output of a factory, is about the nearest approach to a miracle. Such a herd of steel creatures, bearing the winged pyramid brand, recently were photographed behind the Ford plant at Highland Park, Mich. This is far and away the largest number of machines of one make ever marshalled at one place at any one time. The cars were without bodies, but otherwise were complete and ready for shipment. When the shutters of a battery of cameras had clicked and the Ford roundup had been registered on a score of sensitised plates, the cars, which would have stretched for 2 miles if placed radiator to tail lamp, were given over to 200 grimy drivers and sent scurrying to waiting freight cars to be shipped to all parts of the country. It was then that the operators of the motion picture cameras got busy and got an animated exposure for the weekly film news review.

NEW Plant for Zenith Carburetor—The Zenith Carburetor Co., of Detroit, is moving into the factory on the Belt line which it purchased from the Armstrong Woolen Co.

Jones Moves Executive Offices—In order to more closely supervise the business, officials of the Jones Speedometer Co. have removed the executive offices from New York to New Rochelle, the location of the main factory. The plant at Bush Terminal, Brooklyn, will be maintained and operated as in the past.

New Truck for Detroit—J. George Wagner, of Detroit, is forming a \$400,000 company to be known as the Aetna Motor Truck Co. The product of the new concern will be in the 1½-ton class, with an overload capacity of 25 per cent. One of the distinctive features of the design is the use of the imported David Brown worm drive.

Studebaker Perfects Service System—By placing at the disposal of its service department an entire plant, completely outfitted with machinery and able to turn out on short notice parts for every model of its cars now in use, the Studebaker Corp. of Detroit has taken an advance step in perfecting its service system.

Keeton Taking Inventory—The Keeton Motor Car Co., which recently announced some changes in its management, has closed its plant for 2 weeks for the purpose of taking inventory for the 1914 production. In the rearrangement of the Keeton company's executive affairs Mr. Keeton will be relieved by Mr. Newsome of many of his past duties as vice-president. This will give

him a chance to devote more time to the Keeton Motors, Ltd., of Brantford, Canada, of which company he is the president.

Ford May Make Wire Wheels—It is reported that one of the new additions to the Ford plant at Detroit, 80 by 100 feet, will be used exclusively for the manufacture of wire wheels.

Fire at Goodyear Plant—Fire in the waterproofing department of the plant of the Goodyear Tire and Rubber Co., of Akron, O., last week caused a loss of \$20,000, covered by insurance.

Welding Company Enlarges Plant—The Michigan Electric Welding Co. of Detroit has recently completed an addition to its factory which practically doubles its floor space and with additional equipment installed, makes it possible to almost double the present production.

White to Leave Marion—The resignation of W. McKay White as advertising manager and director of the Marion Motor Car Co., Indianapolis, has been announced. He expects to become identified with an Indianapolis company, but has not announced his plans. He was tour chairman of the Indiana-Pacific tour.

Kinnucan Joins Rands Forces—A. J. Kinnucan has taken charge of the service department of the Warren Motor Car Co., which was recently purchased by the Rands Mfg. Co. of Detroit. The Rands' interests will develop this phase of the Warren property along a novel line. It is planned to furnish all repair parts to Warren owners and especially to improve upon the material

and design of certain parts of the car which have in the past proved weak, in such a way that the substitution parts may be installed by owners, to their great advantage.

English Inventor to Visit Here—Alfred Golde, inventor of the Golde patent one-man top and owner of three large factories in Europe, will arrive in this country on August 26 in order to visit his New York branch factory.

Laporte Now Mondex Designer—Charles Laporte, formerly with the United States Motor Co., is now connected as engineer with the Aristos Co., of New York, and is in charge of the design and manufacture of the Mondex devices for motor cars, motor boats and aeroplanes.

Form New Engine Company—A new company is soon to open in Detroit under the name of the McClintock Engine Co., to design, construct, install, equip and deal in all kinds of combustion engines, including engines for motor vehicles. The company was incorporated under the laws of Delaware, with a capital of \$200,000. The incorporators are Francis C. Osborn, G. Edgar Allen and Charles D. McClintock.

Sternberg Needs More Room—The Sternberg Mfg. Co., of Milwaukee, Wis., builder of Sternberg commercial vehicles, has broken ground for a \$50,000 addition to the large plant erected 3 years ago at Forty-sixth avenue and Burnham street. The company has been cramped for room for some time and recently booked orders for trucks for American and South American use which make an enlargement of facili-

ties necessary. It is hoped to complete the addition by October 1. The company will double its working force and output of trucks when the addition is finished.

Leckler with Grossman Company—H. H. Leckler, formerly with the International Harvester Co., the Winton Motor Carriage Co. and the F. B. Stearns Co., has joined the staff of the Emil Grossman Co. of New York in the capacity of mechanical engineer.

Now Building Tiffany Electrics—Production is well under way at the Tiffany Electric Car Co.'s factory at Pontiac, Mich., and deliveries will be made in about 30 days. L. R. Acton has been made manager of this company, of which E. Leroy Pelletier is president.

Keeton Making Alterations—The Keeton Motor Car Co. will make a number of alterations at its factory during the time that it is closed down from August 16 to September 1 for the taking of inventory. When the factory is reopened work will be pushed upon the 1914 production.

Jewell With Handley Company—W. S. Jewell has become identified with the new J. I. Handley Co., of Indianapolis, the selling concern which has been formed for the distribution of Marlon and American cars. Mr. Jewell will have charge of the sales in the metropolitan district, with headquarters in New York.

Goodrich Gets Canadian Site—The Goodrich Rubber Co. has acquired from the Ontario Power Co. title to a large tract of land near Toronto on the Cheppewa Creek, a mile from its mouth, on which it proposes to erect a large factory building or cluster of buildings. The company, it is stated, will within a year have at least 1,800 men employed in the various departments.

To Build Cars at Moose Jaw—The Standard Automobile Co. will soon be in operation in Moose Jaw, Sask., and will turn out cars. The machinery and stock are now being installed at the factory. One feature of the cars is that they will be equipped with wire wheels, and electrically lighted and started. It is proposed to have six styles of bodies, interchangeable with each style of chassis; namely, touring, runabout, roadster, sedan, coupe and limousine.

Hub Factory for Oshkosh—The Oshkosh Pneumatic Hub Co., Oshkosh, Wis., which recently was organized by Fred E. Zeuhlke, Frank Doemel and Joseph Laus, Jr., intends to build a factory to manufacture devices invented and designed by Mr. Laus. The principal specialty is a pneumatic hub for motor vehicle wheels. The company is capitalized at \$20,000.

Will Not Invade America—Frank Briscoe, who, with his brother, Benjamin Briscoe, has organized a motor car company in France, has returned to Detroit for a short time. He states that, contrary to early reports, the car which was designed in France and is now being built there by the Briscoe Freres will not be built in America—not for the present, at least. It is to be their policy to get a firm start abroad before entering the American field. The new car is selling on the Continent for about \$800.

Cadillac Men on Vacation—General Manager W. C. Leland of the Cadillac Motor Car Co. announced that the Cadillac plants are closed for a vacation period from August 18 to September 3. It has been the custom in the past to take this collective vacation during what is known as the turn-over season between the close of production on one model and the starting of work for the following season. Due to the pressure brought by the agencies for the immediate delivery of demonstrating cars of the 1914 model the factory has built 1,500 of the new cars before taking its vacation.

Kerr Joins Stevens-Duryea—To enable its body engineer, George W. Kerr, who since the establishment of the company's body plant at East Springfield, Mass., has acted as manufacturing superintendent, to devote his entire time to the designing and engineering department, the Stevens-Duryea Co. has secured the services of John B. Richards as manufacturing superintendent. Mr. Richards for the past 9 years has been superintendent of the Springfield Metal Body Co.

Start Work on Ford Branch—To be completed in 268 days, an eleven-story reinforced concrete building is being erected at a cost of \$600,000, at Minneapolis, by the Ford Motor Co. for use as a northwestern assembling plant. Work began August 11 and the building is to be turned over January 23, 1914. The building will be 150 by 200 feet. A loading platform covered for 340 feet on Great Northern railway trackage, will accommodate seven freight cars. The equipment of the plant will cost \$290,000.

Morgan & Wright Moving—The Morgan & Write Co. is moving into a group of new buildings at the Detroit plant, which will give it 400,000 square feet of additional floor space and a capacity for 50 per cent increase in production. Work also has been started on more additions which will add another 400,000 square feet of space, which the company expects to occupy the last of March or the first of April, 1914. In order to take care of the increased production facilities, the company's power plant has been doubled in both boiler and engine equipment.

Recent Incorporations

Boston, Mass.—Boston Prest-O-Seal Co., capital stock, \$26,000; incorporators, W. G. Toood, M. T. Hubbard.

Boston, Mass.—F. A. Wood, capital stock, \$12,000; motor car business; incorporators, F. A. Woods, F. Armstrong Woods, E. F. Bleitner.

Bridgeport, Conn.—Bridgeport Body Co., capital stock, \$50,000; to manufacture motor car bodies; incorporators, A. W. Terry, A. W. Seward, J. W. Horton.

Bridgeport, Conn.—Manufacturers' Sales Agency, capital stock, \$25,000; motor car business; incorporators, M. V. Doud, F. K. Doud, Wm. L. Scott.

Chicago—Woods Mobillette Sales Co., capital stock, \$15,000; motor car business; incorporators, F. A. Woods, E. F. Bleitner, J. C. Long.

Cincinnati, O.—Cincinnati Automobile Clearing House Co., capital stock, \$5,000; incorporators, R. Ulrich, C. E. Hornberger, A. R. Shangenburg, L. R. Chadwick, S. D. Bromley.

Cincinnati, O.—Motor Transportation Co., capital stock, \$250,000; incorporators, G. Schorr, E. H. Hoelscher, W. G. Hoelscher, H. A. Hoelscher, W. S. Vosler.

Cleveland, O.—Falcon Co., capital stock, \$15,000; to deal in motor cars and accessories; incorporators, J. H. Cassidy, D. C. Meek, M. A. Copeland, C. Verbsky, W. S. Mitchell.

Coffeyville, Kans.—Isham Garage Co., capital stock, \$5,000; incorporators, E. H. H. George, N. O. Upham, S. H. Hess, C. D. Welch, G. Bayless.

Cold Spring, N. Y.—Herbert F. L. Funke Co., capital stock, \$10,000; motor car supplies; incorporators, H. M. Brigham, A. Michelson, H. F. L. Funke.

East Palestine, O.—McGraw Tire & Rubber Co., capital stock, \$1,000,000.

Edmonton, Alta., Can.—Capital City Taxicab Co., stock, \$100,000.

Falconer, N. Y.—Falconer Iron Works, capital stock, \$15,000; to repair motor cars and conduct garage; incorporators, G. L. Gilbert, J. C. Wright, J. S. Wright.

Ft. Worth, Tex.—Chandler Motor Car Co., capital stock, \$5,000; incorporators, B. K. Smith, M. H. Smith, R. E. Southern.

Grand Rapids, Mich.—Rapid Heater Co., capital stock, \$15,000; to deal in motor cars; incorporators, A. Harris, J. S. McDowell.

Herman, Wis.—Town Herman Auto Transit Co., capital stock, \$8,000; incorporators, W. Grosshuesch, A. Frome, Jr., W. F. Buscher.

Indianapolis, Ind.—Herr-Brooks Corp., capital stock, \$100,000; to handle output of Marathon cars; incorporators, G. Herff, H. Herff, J. Herff, H. H. Brooks.

Grout Sale September 4—The receiver's public sale of the plant and equipment of the defunct Grout Automobile Co. of Orange, N. J., has been scheduled for September 4 at 2 o'clock. The plant has been open for inspection since August 10.

Harris Bros., Incorporate in Michigan—Harris Bros., who have been a corporation of Delaware, have now taken out incorporation papers in Michigan, in order that they may operate in that state. Their new charter gives them a very wide range of activity, including the buying and selling of motor cars, equipment, parts, etc., and also the manufacture of cars. Although it was stated a short time ago that Don McCord would manage the Tiffany Electric Co., Mr. McCord announces that he will not take this position but will retain his connection with Harris Bros.

Vanguard Adds to Staff—The Vanguard Mfg. Co., of Detroit, manufacturer of Vanguard ball bearing windshields, has completed negotiations with S. Christensen to act for them as advertising counsel and field sales manager. Mr. Christensen was, until recently, associated with the Emil Grossman Co., of New York.

Empire Moves Main Offices—New and larger quarters have been taken for the main offices of the Empire Automobile Co. in Indianapolis. Since its organization, the main offices have been at 238 Massachusetts avenue, but now will be at 528 North Capitol avenue in the quarters formerly occupied by the Archey-Atkins Co. The Indianapolis sales branch of the Jones Speedometer Co. has been moved to the building of the Pumpelly Battery Co.

Louisville, Ky.—Monarch Auto Co., capital stock, \$10,000; to sell motor cars; incorporators, C. H. Pierson, J. Gosnell, G. W. Aydelott, A. T. Wingate, C. A. Colley, J. L. Morris.

Louisville, Ky.—Chawck-Smith Automobile Co., capital stock, \$4,500; incorporators, J. T. Chawck, W. J. Chawck, H. R. Smith.

Lexington, Mass.—Kentucky Kissel Car Sales Co., capital stock, \$1,200; incorporators, S. H. Halley, O. R. Hukie, P. M. Justice.

Logansport, Ind.—Auto Distributors Co., capital stock, \$10,000; motor car accessories; incorporators, F. C. King, O. H. Binns, A. E. Birns.

Montreal, Que.—Canadian Drednet Motor Truck, Ltd., capital stock, \$125,000; incorporators, W. L. Haskell, J. S. Bigby.

Montreal, Can.—Crown Motor Car & Foundries, Ltd., capital stock, \$100,000.

New York—H. C. Wells Perfect Motor Co., capital stock, \$25,000; to manufacture and deal in motor cars; incorporators, F. A. B. Meinhardt, H. C. Well, M. H. Well.

New York—Vedvet Co., capital stock, \$5,000; incorporators, W. D. Ramsburgh, H. C. Proctor, A. H. Miller.

New York—Army Tire Co., capital stock, \$1,000,000; to manufacture, sell and deal in motor cars; incorporators, G. W. Griffin, F. H. Kessel, L. J. Roll, M. M. Alegere, Jr.

New York—Army Tire Co., capital stock, \$1,000,000; to manufacture and sell motor cars.

New York—H. C. Well Perfect Motor Co., capital stock, \$25,000; incorporators, H. C. Well, M. M. Well, F. A. B. Meinhardt.

New York—Bavler Lubrication System, capital stock, \$10,000; to manufacture lubricating systems; incorporators, E. Well, G. H. Duck, C. S. Bavler.

New York—Auto Pedal Pad Co., capital stock, \$10,000; to manufacture pedal pads; incorporators, H. Reich, E. M. Lichter, G. T. Young.

Pittsburgh, Pa.—Axwell Equipment Co., capital stock, \$5,000; to manufacture supplies; incorporators, F. Patterson, W. J. Mulvihill, J. R. D. Huston.

Regina, Sask.—New Era Tire Treatment Co., capital stock, \$20,000.

San Marcos, Tex.—Bradley Moore Auto Co., capital stock, \$6,000; incorporators, J. M. Moore, F. Bradley, I. W. Wood.

Sharon Springs, N. Y.—Sharon Springs & Canajoharie Auto-Bus & Car-Lin Co., capital stock, \$1,000; incorporators, W. H. Craig, O. E. Elgen, C. R. Winnie.

Toledo, O.—Toledo Co-Operative Garage Co., capital stock, \$10,000; incorporators, H. L. Stebbins, E. A. Schramm.

Vancouver, B. C.—Auto Clearing House, capital stock, \$10,000.

Wilmington, Del.—Filled Omnibus Co., capital stock, \$500,000; to manufacture and deal in motor cars.

Wethersfield, Conn.—J. N. Macdonald Co., capital stock, \$10,000; to sell and repair motor cars; incorporators, J. Macdonald, R. D. Britton, S. M. Lynnehan.

Williamsville, N. Y.—Williamsville Auto Repair & Garage Co., capital stock, \$500; incorporators, S. A. Hirsch, C. Hirsch, G. W. Walters.

The Accessory Corner

Magneto-Operated Horn for Ford Cars Which Tells Whether or Not the Motor Is Running Properly—A Fan Which Generates Current for Lighting, Starting and Charging Batteries—Carbureter Which Handles Kerosene, and Which Anyone Can Adjust

Kemco Generator Fan

A MOTOR fan which cools the engine and generates current for starting, lighting, charging storage batteries and operating a horn, is offered by the Kouyoumjam Electric & Mfg. Co., Cleveland,

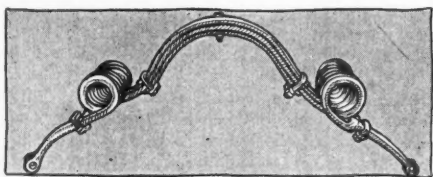


FIG. 1—THOMAS COIL SPRING FOR FORDS
Their use is said to make riding in this car easier

O. The fan does not appear much different from the ordinary form of motor fan, as may be seen by referring to Fig. 6. The feature of this device is the automatic regulation obtained, it is said, without the use of complicated mechanism.

Ford Magneto Blows Horn

A vibrator horn operated by the magneto and one that will notify the driver of a Ford whether or not the coil vibrators are properly adjusted, is the latest to the field of Ford accessories. It is being manufactured by the Premier Electric Co., Chi-

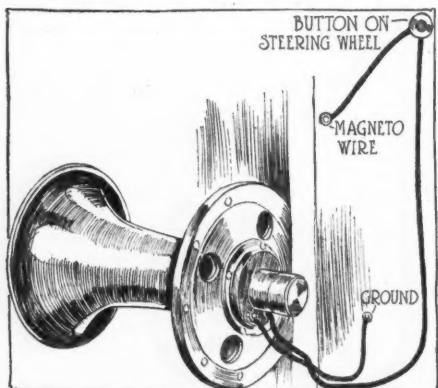


FIG. 2—HI-LO FORD HORN
Operated from the magneto and indicates a missing cylinder

cago, and is illustrated in Fig. 2. Simplicity of construction and installation are other features of this new horn, known as the Hi-lo. It is called so because it gives a low sound at low motor speeds and a high note at high motor speeds. The low speed signal is sufficient to warn pedestrians. With a current consumption of about 5 amperes, this horn may be used at the

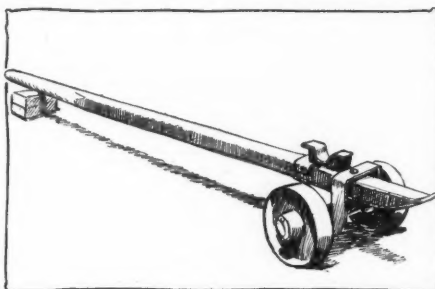


FIG. 3—HOLMES WRECKING TRUCK
With it, it is possible to run a car with a wheel off

same time current is being furnished for the lights. However, this condition causes a slight flicker of the lights.

If the coil vibrators are adjusted properly the horn will give a uniform tone, but as soon as the adjustment of one is not as it should be the horn gives an uneven sound and will give this sound until the faulty vibrator is found and adjusted.

Any Ford owner may install the horn himself, there being provided wires and a button. The latter is clamped to the steering wheel. The maker issues instructions for mounting the horn, but will do this work without adding to the initial cost of the horn, which is \$4.00.

Whichway Rear Axle

A new type of rear signal shown in Fig. 4 has been brought out by the Universal Signal & Supply Co., Chicago. Al-

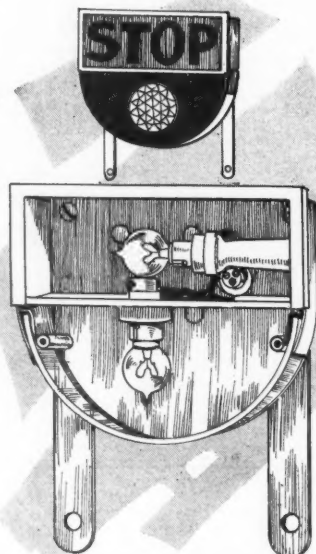


FIG. 4—WHICHWAY REAR SIGNAL
Indicates stop as shown above when the brake is applied

though a similar type has been on the market for some time, the new signal is one which sells for \$7.50 and has most of the advantages of the former one which sold for considerably more.

When the brake pedal is pressed the

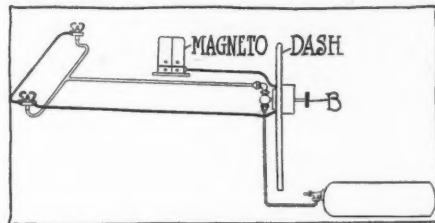


FIG. 5—ACME AUTO-LITER
Uses magneto current for lighting the lamps which is done from the seat

word "STOP" appears illuminated in the rear of the car, the attachment for performing this operation being a simple switch. When the pedal is not being pressed, the conventional red light appears at the rear. A portion of the light is deflected through clear glass to the license pad.

Fig. 4 shows both the outside and inside of the Whichway signal. It will be seen there are two compartments, each containing a 6-volt bulb, which are operative from the battery or from dry cells.

Holmes Wrecking Truck

Robert Holmes & Bros., Danville, Ill., is marketing the Holmes wrecking truck illustrated in Fig. 3. With this truck it is possible to run a motor car with a

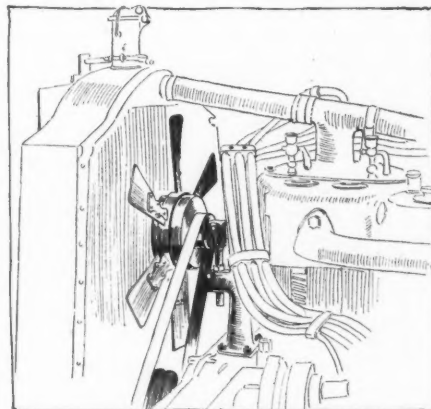


FIG. 6—KEMCO FAN GENERATOR
Supplies current for starting, lighting and charging batteries

wheel off, a broken spindle or a broken axle. The maker claims that when the truck is substituted for a wheel the car may be towed to a garage at full speed.

In the illustration the grooved portion over the wheels of the truck supports the axle.

Akron Air Starter

In the Akron air starter, manufactured by the Motor Starting Co., Akron, O., use is made of a reciprocating air motor of the three-cylinder type, which operates as a compressor when the engine of the car is operating it. Incorporated with this motor-compressor is a change-speed gear as shown in Fig. 7. This is used in order to cause the motor to operate at higher speeds when it is being used as a compressor. The gear-changing is automatic, being controlled by the system itself.

When the starting valve is pressed the motor drives directly through the silent chain as shown, but as soon as the pump clutch pedal is pressed the change-speed gear comes into play automatically, and the motor which now becomes a compressor, pumps air into the tank. When the pedal is released the pumping ceases. A feature of the Akron system is the tire-inflating unit which is shown in the illustration. The air for the tires is supplied

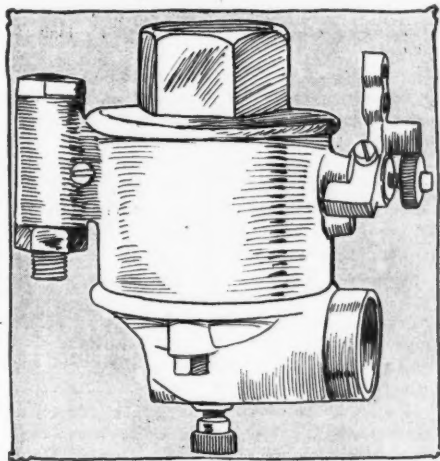


FIG. 8—OUTSIDE VIEW OF EIKER CARBURETER

Uses gasoline, kerosene and low-grade fuels.

from the tank, the pressure within being indicated by a gauge on the dash. The total weight of the system installed is about 50 pounds. Installation may be made in any type of pleasure or commercial vehicle.

Acme Auto-Lighter

Bloomfield, Ind., comes into the lime-light with a device for lighting acetylene headlights from the seat of the car, the agent being electricity, which is supplied by the magneto. The manufacturer is the Acme Auto-Liter Co. and the device is shown installed in the lighting system in Fig. 5. It will be noticed that the magneto supplies the spark which ignites the gas. The disk-shaped handle B is turned and gas is admitted from the tank to the headlights and at the same time current from the magneto is led to the burner of the lamp.

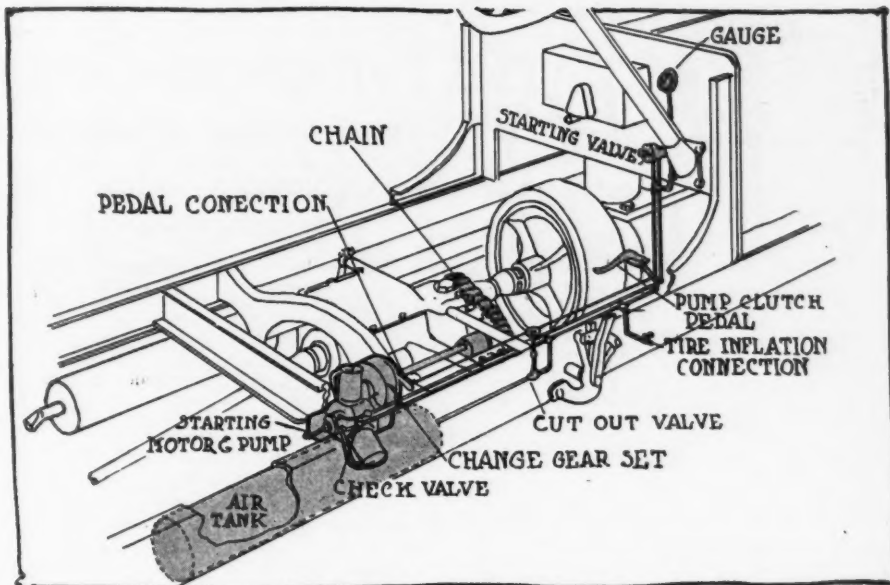


FIG. 7—AKRON AIR STARTER AND TIRE INFLATOR

Motor-compressor has an automatic change-speed gear which causes high-operating speeds when motor becomes a compressor

The spark jumps the gap formed by the two curved pieces, as it does in a spark-plug. By turning the disk to the left or right the lights are raised, lowered or extinguished, as desired.

Thomas Coil Spring for Fords

The Thomas Auxiliary Spring Co., has brought out the rear suspension for Ford cars, shown in Fig. 1. The spring supplied with Ford cars is removed and in its place is used the one shown, which as will be seen, has incorporated two auxiliary coil springs. It is claimed that the location and material of the device makes riding easier. No special fittings are used with these springs, the clips and nuts supplied with the car being used.

Eiker Carbureter

The Eiker Carbureter Co., New York, is offering a carbureter with a single air intake and which is claimed to handle gasoline, kerosene and low-grade fuels. Simplicity is the dominating feature. The cross-sectional diagram in Fig. 9 shows the single air intake in the form of a

poppet valve, adjustable by thumb screw. One important feature of the Eiker carbureter, it is claimed, is, that it may be adjusted for extremely low or high speeds by the average motor car owner in a short time. The maker states also that the proper mixture is sent to the cylinders regardless of engine speed and that at no time will overheating result. To prevent theft, the needle valve may be carried away and the car left standing and it is claimed that no expert is required to replace the needle properly. Another feature for which many claims are made is shown in the cross-sectional diagram on this page. Here the nozzle is shown in the throttle. The Eiker carbureter is made in three sizes, namely, 1, 1 1/4 and 1 1/2-inch, the price of the first two mentioned being \$14 each and the last \$21.

Arbeco Lamp Made of Glass

The Reynolds-Browne Co., Chicago, has introduced a glass lamp which is claimed to have interesting features. Perhaps the most important of these is the fact that the lamp does not require polishing, being made of heavy glass. There are two parts—the inner and outer body, with a vacuum between. The silver reflecting mirror is applied to the outer surface of the inside of the lamp, thus affording a clear glass surface surrounding the light itself. Whatever color is desired for the outside of the lamp, whether it is to match the body of the car, or be finished in gold, brass, nickel, copper or any color desired, is applied to the under surface of the outside of the lamp. Thus the reflector as well as the outside may be thoroughly cleaned almost instantly by wiping with a damp cloth or a hose may be turned on the lamp inside and out without damaging it. The reflector is molded in a parabolic curve, and is very neat in appearance as well as effective in giving light, according to the maker.

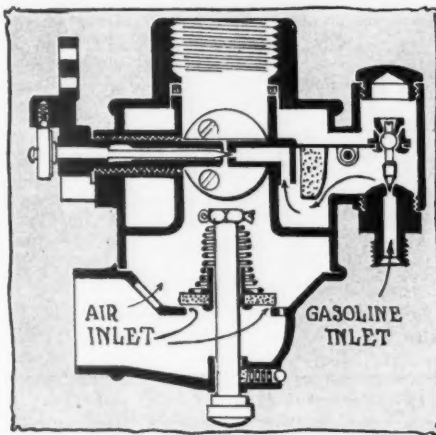
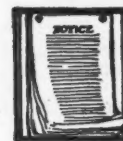


FIG. 9—CROSS-SECTIONAL DIAGRAM OF EIKER CARBURETER

Note that the spray nozzle is in the throttle



Brief Business Announcements



Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

| Town | Agent | Make | Town | Agent | Make |
|--------------------|--------------------------|--------------|--------------------|----------------------------------|--------------|
| Birmingham, Ala. | Haynes Motor Co. | Haynes | Los Angeles, Cal. | Lord Motor Car Co. | Maxwell |
| Bowling Green, O. | C. D. Yonker | Metz | Minneapolis, Minn. | Fawkes Automobile Co. | Metz |
| Columbus, O. | Broad-Oak Automobile Co. | Pierce-Arrow | Minneapolis, Minn. | MacArthur, Thompson, Zollars Co. | Imp cyclecar |
| Columbus, O. | Broad-Oak Automobile Co. | Chalmers | Minneapolis, Minn. | Northwestern Automobile Co. | Chandler |
| Columbus, O. | Broad-Oak Automobile Co. | Reo | Montreal, Que. | Juneau & Grothe | Franklin |
| Columbus, O. | Ira Madden | Fiat | New York | Sidney B. Bowman | Oakland |
| Indianapolis, Ind. | Harry L. Archey | Aldo | Philadelphia, Pa. | American Automobile Co. | Marion |
| Lima, O. | Thomas Motor Co. | Cole | | | |

COMMERCIAL CARS

| | | | | | |
|-----------------|---------------|--------|----------------|-------------------|----------|
| Hartford, Conn. | Keeney Garage | Selden | Montreal, Can. | A. Jennings & Co. | Atlantic |
|-----------------|---------------|--------|----------------|-------------------|----------|

UHLRICHSVILLE, O.—A \$20,000 fire at Uhlrichsville last week destroyed the Barr Bros.' garage and fifty motor cars.

Springfield, Mass.—John Hall, Jr., who started a body-painting plant with William Mitchell, has bought out Mitchell's interest.

Farmington, Me.—S. J. Wyman has purchased an interest in the garage conducted by J. C. French. A new firm has been organized.

Seattle, Wash.—Arthur H. Hertz has resigned from the management of the Seattle branch of Gerlinger Motor Car Co., and C. W. Dansie has been installed as manager.

Portland, Ore.—Fred W. West, for some time past associated with the J. W. Leavitt & Co. of San Francisco, has succeeded H. A. Scarlett, as head of the Portland branch of the company.

Grand Rapids, Mich.—G. and E. Tisch of this city have been appointed western Michigan distributors for the tires and other accessories made by the Federal Rubber Mfg. Co. of Milwaukee.

Cleveland, O.—Papers have been filed with the secretary of state changing the name of the Velle-Paige Motor Car Co., of Cleveland, to the Velle Motor Car Co. The concern is a retail agency for the Velle.

Kansas City, Mo.—The Bunting-Stone Hardware Co. of Kansas City will open a motor car accessory department in connection with its present hardware business October 1.

Indianapolis, Ind.—John C. Stiles, who has been with the Indianapolis sales branch of the Stewart-Warner speedometer, has been advanced to western representative of the company and has located in St. Louis.

Kaukauna, Wis.—M. A. Lemke, of Kaukauna, Wis., has started construction work on a new garage building and repair shop, which will cost about \$15,000. He intends to conduct an agency business but has not yet closed for his lines.

Kenosha, Wis.—Milton A. Kent has sold his interests in the Rambler Sales Room, 366 Park avenue, to Charles E. Turnock, who will take immediate possession, and will handle the 1914 Rambler line in Kenosha county and the east half of Racine county.

Dallas, Tex.—Work on the Ford Motor Co.'s assembling plant to be located in this city is expected to begin within a few weeks. The company has purchased, at a cost of nearly \$100,000, 2 blocks of ground. The plant will cost upwards of \$300,000.

New York—John D. von der Leith, for 5 years connected with the Splitdorf Electrical Co., has severed his connection with that organization to enter business on his own account. He has formed the Reliable Auto Specialty Co., with headquarters at 306 Mott avenue, New York city, to handle

motor car accessories in general but magnetos, coils, spark plugs, cable and other ignition devices in particular.

Toronto, Ont.—Gaulois tires are to be sold in Toronto through Edgar Walker, who has opened a show room at 127 Bay street.

Bridgeport, Conn.—Certificates of reduction of capital stock of the Blue Ribbon Garage Co., Bridgeport, from \$100,000 to \$6,000 has been filed with the secretary of state.

Los Angeles, Cal.—The F. B. Stearns Co. recently opened its new factory branch in Los Angeles at 742 South Olive street. J. H. McDuffee will manage the branch.

Tacoma, Wash.—E. M. Streeter, formerly Cole representative in Tacoma, has given up the agency. Homer W. Bunker, formerly southwestern Washington distributor for Lozier cars, has quit the motor car business for insurance.

Indianapolis, Ind.—A. E. Berdon, former chief engineer of the Esterline Co., and designer of the Graphic meters, has resigned from his position with the Indianapolis concern. His future intentions have not yet been made public.

Boston, Mass.—Frederick C. Harrington has been appointed sales manager of the Myer Abrams Co. of Boston, New England distributor of the Lauth-Juergens trucks, to take the place of L. C. Harmon, who resigned a few weeks ago.

Detroit, Mich.—M. B. Petcher, formerly of the Maxwell Motor Co., has been appointed Detroit manager of the Rayfield carbureter, and has moved into new quarters at 1211 Woodward avenue, where he has established a service station.

New Orleans, La.—Loss said to aggregate \$115,000 resulted from a fire in the garages of the Louisiana Motor Car Co. and the Enterprise Automobile and Electric Co. of New Orleans. One freak of the fire was that \$40,000 worth of motor cars and supplies, the only portion of the stocks insured, were not damaged.

Columbus, O.—The Twyman Motor Car Co., Studebaker distributor, has opened a retail store in Columbus. With the wholesale department in Columbus, the retail stores in Dayton, Cincinnati and Columbus, the company is operating four stores and supplying nearly 100 dealers. O. W. Lawson is the manager of the new Columbus retail store.

Hartford, Conn.—The interests of H. D. Graves, Hartford distributor of the Lozier and Henderson cars and proprietor of the Imperial garage at 120 Allyn street and those of the Capitol City Auto Co., at the corner of Allyn and High streets, have been merged. Business will be conducted under the name of the Capitol City Auto Co., of which Graves has been elected secretary. Bernard F. Smith is president and W. F. Dahill treas-

urer. The concern will handle the Mitchell, Lozier and Henderson passenger cars and the Stewart truck.

Columbus, O.—A. G. Sutherland, formerly assistant manager of the Columbus Ford branch, has accepted a position with the Columbus Buggy Co.

Minneapolis, Minn.—L. E. Carpenter and A. W. Clark, 510 Temple court, have organized the Doxameter Sales Co. to handle the Doxameter.

Calgary, Alta.—The Dominion garage at Calgary was completely destroyed by fire on August 2. Fifteen motor cars and a number of motorcycles were burned. The loss is \$50,000.

Saco, Me.—The Garland Automobile Co., with headquarters on Pepperell square, has been reorganized. The new firm comprises William A. Gilman and Ira Garland.

Detroit, Mich.—W. C. Boone, who was office manager of the Detroit branch of the Jones Speedometer Co., has returned to the Jones factory at New Rochelle, N. Y., where he will be located for the present.


Coshocton, O.—A. L. Crowthers & Co., located on West Main street, Coshocton, O., will soon erect a fireproof garage and repair shop on the present site of the garage. The new structure will be 100 by 65 feet and will be constructed of cement block.

St. Louis, Mo.—At the monthly dinner of the St. Louis Automobile Dealers' and Manufacturers' Association at Forest Park Highlands last week, Joseph A. Schlecht of the Mound City Buggy Co. was elected treasurer and Ralph C. Doak was elected director, to fill vacancies.

Philadelphia, Pa.—The six-story building at 142-144 North Broad street has been sold to Percy L. Neel, president of the Automobile Sales Corp., the present occupant, for \$150,000, subject to a mortgage of an equal amount. The property, which occupies a lot 51 by 180 feet, is in the center of the motor sales district.

Detroit, Mich.—The Wetmore-Quinn Co., which recently purchased the Paige-Detroit agency from the William J. Marshall Auto Co., has added the Lozier to its line. The Grant brothers, who formerly handled the Lozier, relinquished the agency on their entry into the manufacturing field as the builders of the new Grant light car. Mr. Wetmore formerly was assistant sales manager of the Lozier Motor Co.

Indianapolis, Ind.—The Barrier-Sawin Co., Indianapolis, Ind., is a new incorporation, with \$10,000 capital stock, to deal in motor car accessories and specialties. A suite of offices has been secured in the State Life building. The new company takes over the business of B. Jay Barrier, Cincinnati, O., and a branch office will be retained in that city.



A Declaration of Advertising Policy

For six years before the American motoring public, Stromberg Carburetors today are almost universally considered the **Standard** by which all other carburetors are judged. We attribute our success in great measure to having told the TRUTH about our product. We did not have to learn by experience that a cleverly varnished untruth might sell a product—but could not keep it sold. We built for the FUTURE.

STROMBERG
CARBURETORS

"The Accepted Standard"

There has never been a time when a motorist has had to take our word for any statement we have made in an advertisement. It has consistently been our practice to tell motorists about Stromberg "Economy," "Power," "Flexibility," what not, and then let them prove to their own satisfaction what we told them. At our own expense their cars have been equipped with Stromberg Carburetors, with the understanding that they were to be tried out by the **motorist himself**, any reasonable way he has seen fit, and if our carburetor was not as good as our advertisement claimed it to be, its full purchase price was to be refunded and no questions asked. We wouldn't be satisfied unless he was. **The motorist has had to sell himself.**

We want every motorist to know that there is a Stromberg carburetor waiting for him at our nearest Service Station, ready to back up at our expense every advertising claim we make for it. If you believe in the efficacy of the "Missouri Test," write us for full particulars.

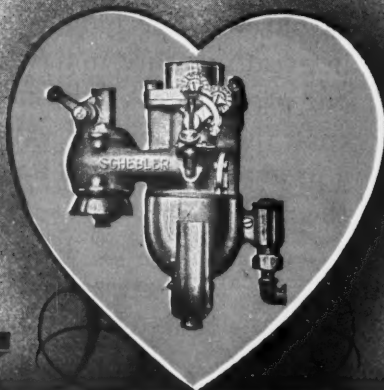
The Stromberg Motor Devices Co.

54 East 25th Street, Chicago, Ill.

Branches: NEW YORK BOSTON DETROIT INDIANAPOLIS MINNEAPOLIS
PACIFIC COAST DISTRIBUTORS:
Chandler & Lyon Co., Los Angeles, Portland, Fresno, Spokane, San Francisco, Seattle, Canadian
Distributors: Russell Motor Car Co., Toronto, Montreal, Hamilton, Winnipeg, Calgary, Vancouver.

SCHEBLER

*The Aristocrat
of Carburetors*



"The Heart of the Automobile"

WHEELER & SCHEBLER

"Pioneers in Perfection" of Carburetion

MANUFACTURERS
INDIANAPOLIS U.S.A.

THE SCHEBLER IS THE ACKNOWLEDGED STANDARD CARBURETOR OF THE WORLD

Branches

NEW YORK
BOSTON
PHILADELPHIA
ATLANTA
MINNEAPOLIS
KANSAS CITY
CHICAGO

DETROIT
DENVER
SAN FRANCISCO
LOS ANGELES
SEATTLE
MONTREAL CAN.
SIDNEY AUSTRALIA

Service Department

Distributors

Every city and town in
the United States and
Canada • Europe and
• Australia •

The car maker who claims to make "High Grade" Cars can't afford NOT to equip with the Klaxon

There are a dozen well-known makes of tires.

There are several speedometers, carburetors, magnetos, starters; all are equally well known, equally high-grade.

By equipping with any of them the car manufacturer can fulfill his claim of a "high grade" car.

But when the manufacturer comes to select his warning signal he faces no such latitude of choice.

He finds just one "high grade" signal universally recognized as such. There is no other. He MUST equip with the Klaxon.

He knows that if he doesn't he casts suspicion and doubt upon his claims for his car. He burdens his agents with the necessity of arguing, defending, explaining the unknown "horn" -- and of frequently having to add a Klaxon at his own expense to satisfy the customer's demands.

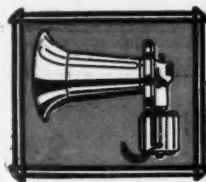


KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

CARS NOW KLAXONIZED

A. E. C.
Alco
Armleder
Autocar
H. H. Babcock
Benz
Borland Electric
Broc Electric
Buffalo Electric
Roadster
Century Electric
Charon (European)
Chicago Electric
Columbia
Croxtan
Davis
F. I. A. T.
Havers "Six"
Hudson (Special)
King
Kissel
Knickerbocker
Knox
Lancia (European)
Locomobile
Lozier
Marmon
Matheson
Maxwell "Six"
Mercedes
Metallurgique
Multiplex
National
Nyberg
Oakland
Oldsmobile
Packard
Peerless
Peugeot
Pierce-Arrow
Pope-Hartford
"Six"
Pratt
Rambler
S. & M. "Six"
Schneider (European)
S. G. V.
Simplex
Stafford
Staver
Stearns
Sternberg
Stevens-Duryea
Stoddard-Dayton
Touraine
Walker Electric
Ward
White
Winton

Regal

Mr. Dealer—the Big Question Is— Cars You Can Sell Easily Because of Quality and Price

You are in this motor car business to make the biggest profits possible this year. That means you *must* sell a *large number* of cars.

What cars sell in largest numbers?

The automobiles that offer efficient and lasting service, with low up-keep, at prices within reach of the majority of prospects.

That is why Regal dealers sold their cars easily and made large profits last year.

Regal Underslung Cars

Our cars sell in the "around \$1000" class—the big market that is going to be bigger this year. The underslung construction presents selling features you cannot find in any overhung car at or near the price.

Investigate our claims. Let us prove why you should handle Regal Underslugs—for your profit—*increase this year.*

Regal Underslung Features

You can't offer a prospect a safer car. The underslung construction reduces skidding to a minimum. The "turning turtle" peril is eliminated.

Remarkable ease of riding is achieved by our distinctive spring construction and method of attaching. The limited upward rebound of these springs saves tires. The straightline drive saves power and gasoline.

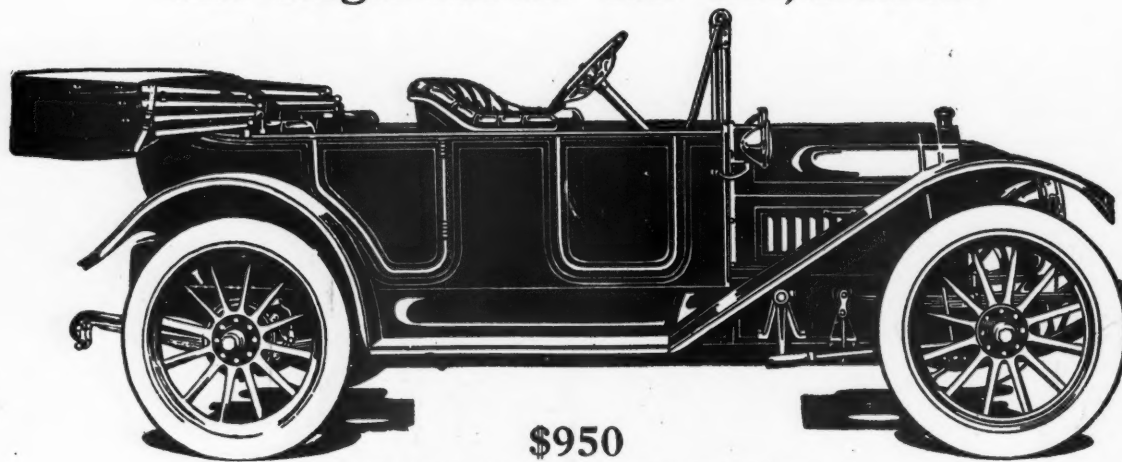
Our engineers have attained a remarkable degree of

strength, durability, dependability and power in these cars.

We claim that in point of body design Regal Underslung cars are not surpassed by automobiles costing double or even treble the price. Compare the low, sweeping, rakish lines of a Regal with those of other cars and you will be convinced of the truth of our claims.

Now is the time to act. Write today for our catalog and dealer's proposition. We've got a story of vital interest to every dealer in the United States. Write for catalog, M.

The Regal Motor Car Co., Detroit



\$950

Regal Model "T" Underslung Touring Car

Extra equipment, top, windshield and speedometer—\$75

Other Regal Underslung Cars are Model "N" Roadster and our Colonial Coupe

(106)

Index To Automobile Manufacturers Who Have Contracted For



Storage Batteries

| | |
|-------------------------------------|-------------------------|
| A | |
| Abbott Motor Co. | Detroit, Mich. |
| Adams-Lancia Co. | New York City |
| Allen Motor Car Co. | Fostoria, Ohio |
| Alpena Motor Car Co. | Alpena, Mich. |
| American La France Fire Engine Co. | Elmira, N. Y. |
| American Locomotive Co. | Providence, R. I. |
| American Motors Co. | Indianapolis, Ind. |
| Ames Motor Car Co. | Owensboro, Ky. |
| Apperson Bros. Automobile Co. | Kokomo, Ind. |
| O. Armleder Company | Cincinnati, Ohio |
| Auburn Automobile Co. | Auburn, Ind. |
| Austin Automobile Co. | Grand Rapids, Mich. |
| The Avery Company | Peoria, Ill. |
| B | |
| Bartholomew Company | Peoria, Ill. |
| Benton Motor Car Co. | Benton, Ill. |
| Buckeye Manufacturing Co. | Anderson, Ind. |
| C | |
| Canadian Standard Auto & Tract. Co. | Fort Wayne, Ind. |
| Cartecar Company | Pontiac, Mich. |
| J. I. Case T. M. Machine Works | Racine, Wis. |
| Chadwick Engineering Works | Pottstown, Pa. |
| Chandler Motor Car Co. | Cleveland, Ohio |
| F. Coleman Carriage & Harness Co. | Ilion, N. Y. |
| Columbus Buggy Company | Columbus, Ohio |
| Commerce Motor Truck Co. | Detroit, Mich. |
| Corbitt Automobile Co. | Henderson, N. C. |
| Crane Motor Car Co. | Bayonne, N. J. |
| Crawford Automobile Co. | Hagerstown, Md. |
| Crescent Motor Company | Cincinnati, Ohio |
| Crow Motor Car Co. | Elkhart, Ind. |
| James Cunningham Son & Co. | Rochester, N. Y. |
| Cutting Motor Car Co. | Jackson, Mich. |
| Croxton Motor Car Co. | Washington, Pa. |
| D | |
| Geo. W. Davis Carriage Co. | Richmond, Ind. |
| Di Dion Bouton | New York City |
| Dorris Motor Car Co. | St. Louis, Mo. |
| E | |
| Enger Motor Car Co. | Cincinnati, Ohio |
| Elkhart Carriage & Harness Co. | Elkhart, Ind. |
| F | |
| F. I. A. T. Company | Poughkeepsie, N. Y. |
| Flanders Motor Co. | Detroit, Mich. |
| H. H. Franklin Manufacturing Co. | Syracuse, N. Y. |
| G | |
| Gramm-Bernstein Company | Lima, Ohio |
| Gramm Motor Truck Co. | Lima, Ohio |
| Gramm Motor Truck Co. | Walkerville, Ont. |
| Great Western Automobile Co. | Peru, Ind. |
| H | |
| Havers Motor Car Co. | Port Huron, Mich. |
| Haynes Automobile Co. | Kokomo, Ind. |
| Henderson Motor Car Co. | Indianapolis, Ind. |
| Herreshoff Motor Co. | Detroit, Mich. |
| I | |
| Ideal Motor Car Co. | Indianapolis, Ind. |
| Imperial Automobile Co. | Jackson, Mich. |
| J | |
| Jackson Motor Car Co. | Jackson, Mich. |
| K | |
| Kelly-Springfield Motor Truck Co. | Springfield, Ohio |
| King Motor Car Co. | Detroit, Mich. |
| Kissel Motor Car Co. | Hartford, Wis. |
| Kline Motor Car Co. | Richmond, Va. |
| Knox Automobile Co. | Springfield, Mass. |
| Krit Motor Car Co. | Detroit, Mich. |
| L | |
| Lenox Motor Car Co. | Boston, Mass. |
| Lexington Motor Car Co. | Connersville, Ind. |
| Little Motor Car Co. | Flint, Mich. |
| Locomobile Co. of America | Bridgeport, Conn. |
| Lozier Motor Car Co. | Detroit, Mich. |
| Lyons Atlas Co. | Indianapolis, Ind. |
| M | |
| W. H. McIntyre Co. | Auburn, Ind. |
| McLaughlin Motor Car Co. | Oshawa, Ont. |
| Marathon Motor Co. | Nashville, Tenn. |
| Marion Motor Car Co. | Indianapolis, Ind. |
| Maritime Motor Car Co., Ltd. | St. John, N. B. |
| Martindale & Millikan | Franklin, Ind. |
| Maxwell Motor Car Co. | Detroit, Mich. |
| Mercer Automobile Co. | Trenton, N. J. |
| Metzger Motor Car Co. | Detroit, Mich. |
| Michigan Buggy Co. | Kalamazoo, Mich. |
| Midland Motor Car Co. | Moline, Ill. |
| Mitchell-Lewis Motor Car Co. | Racine, Wis. |
| Moline Automobile Co. | East Moline, Ill. |
| Moon Motor Car Co. | St. Louis, Mo. |
| Motor Car Manufacturing Co. | Indianapolis, Ind. |
| N | |
| Nance Motor Car Co. | Philadelphia, Pa. |
| National Motor Vehicle Co. | Indianapolis, Ind. |
| Nordyke & Marmon Co. | Indianapolis, Ind. |
| Norwalk Motor Car Co. | Martinsburg, W. Va. |
| Nova Scotia Carriage Co. | Kentville, N. S. |
| Nyberg Automobile Works | Anderson, Ind. |
| O | |
| Oakland Motor Car Co. | Pontiac, Mich. |
| P | |
| Packard Motor Car Co. | Detroit, Mich. |
| Paige-Detroit Motor Car Co. | Detroit, Mich. |
| Palmer & Singer Mfg. Co. | Long Island City, N. Y. |
| Patterson Wagon Works | Flint, Mich. |
| Peerless Motor Car Co. | Cleveland, Ohio |
| Pilot Motor Car Co. | Richmond, Ind. |
| Pope Manufacturing Co. | Hartford, Conn. |
| Premier Motor Car Co. | Indianapolis, Ind. |
| Pullman Motor Car Co. | York, Pa. |
| R | |
| Regal Motor Car Co. | Detroit, Mich. |
| Renault-Freres Selling Co. | New York City |
| Reo Motor Car Co. | Lansing, Mich. |
| Reo Motor Car Co. of Canada | St. Catharines, Ont. |
| Russell Motor Car Co. | West Toronto, Ont. |
| S | |
| Sayers & Scovill Co. | Cincinnati, Ohio |
| Schacht Motor Car Co. | Cincinnati, Ohio |
| Seagrave Company | Columbus, Ohio |
| Selden Motor Car Co. | Rochester, N. Y. |
| Simplex Automobile Co. | New Brunswick, N. J. |
| A. O. Smith Company | Milwaukee, Wis. |
| South Bend Motor Car Works | South Bend, Ind. |
| Spaulding Manufacturing Co. | Grinnell, Iowa |
| Speedwell Motor Car Co. | Dayton, Ohio |
| Stanley Motor Car Co. | Newton, Mass. |
| Staver Carriage Co. | Chicago, Ill. |
| F. B. Stearns Co. | Cleveland, Ohio |
| Stegeman Motor Car Co. | Milwaukee, Wis. |
| Sternberg Manufacturing Co. | Milwaukee, Wis. |
| Stevens-Duryea Co. | Chicopee Falls, Mass. |
| Stoddard-Dayton Co. (Maxwell) | Dayton, Ohio |
| Studebaker Corporation | Detroit, Mich. |
| T | |
| Tudhope Motor Car Co. | Orillia, Canada |
| V | |
| Vandewater & Company | Elizabeth, N. J. |
| Velle Motor Vehicle Co. | Moline, Ill. |
| W | |
| Warren Motor Car Co. | Detroit, Mich. |
| Wayne Works | Richmond, Ind. |
| Webb Company | Allentown, Pa. |
| Westcott Motor Car Co. | Richmond, Ind. |
| White Company | Cleveland, Ohio |
| Wichita Falls Motor Co. | Wichita Falls, Tex. |
| Willys-Overland Co. | Toledo, Ohio |
| Winton Motor Car Co. | Cleveland, Ohio |
| Z | |
| Zimmerman Manufacturing Co. | Auburn, Ind. |

Willard Storage Battery Company
CLEVELAND, OHIO

(41)



Did you see the big announcement of the New Series Premier?

If not, we'll gladly mail you a copy.

This announcement has stirred up more interest, brought in more inquiries and applications than the announcement of the Little Six Premier last August, which created a sensation.

The Premier again establishes its lead for 1914

Premier Motor Mfg. Co., Indianapolis

HOLLEY

CARBURETOR



No Moving Parts

Only One Adjustment

The Consensus of Engineering Opinion

Regarding the self-adjusting, no-moving-parts Holley is that it is the best automobile carburetor made.

Holley Brothers Company are now supplying more automobile gas engine carburetors than all the other makers combined.

Over 215,000 finished carburetors will be shipped this year.
The entire 1913 output is sold.

1914 demonstration outfits now ready.
Send in your specifications early.

HOLLEY BROTHERS CO., 131-141 Rowena St., Detroit

AUTOMOBILE SUPPLY COMPANY...1335 Michigan Boulevard, Chicago, Ill. OMAHA RUBBER COMPANY.....Omaha, Neb.
FOREIGN BRANCH: Holley Bros. Co., Coventry, England

Holley Carburetors are carried in stock at the following addresses: CHAS. E. MILLER, Home Office: 97-103 Reade St. and 121 Chambers St., New York

BRANCHES:

New York City.....924 Eighth Ave.
Between 54th and 55th Sts.
New York City.....2782 Broadway
Between 107th and 108th Sts.
Springfield, Mass.....Bridge and Dwight Sts.

Hartford, Conn.....274 Trumbull St.
Atlanta, Ga.....66 Edgewood Ave.
Brooklyn, N. Y.....1421 Bedford Ave.
Buffalo, N. Y.....824 Main St.
Albany, N. Y.....135 Central Ave.
Boston, Mass.....202-204 Columbus Ave.

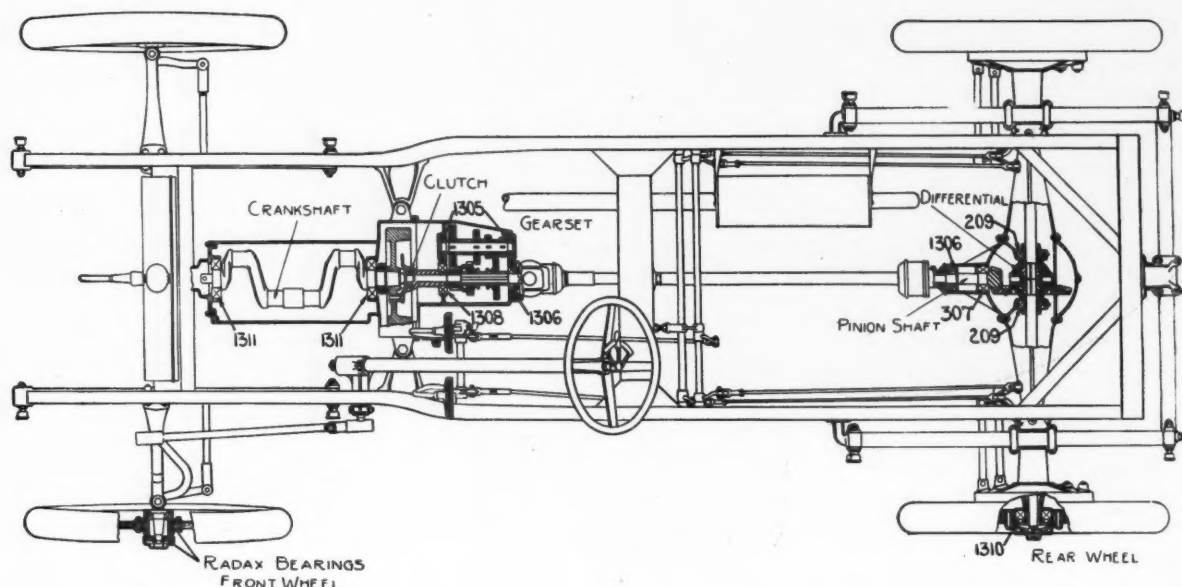
Detroit, Mich.....227-229 Jefferson Ave.
Cleveland, Ohio.....1829 Euclid Ave.
Philadelphia, Pa.....318 North Broad St.
New Orleans, La.....601-603 Baronne St.
Newark, N. J.....274 Halsey St.

When Writing to Advertisers, Please Mention Motor Age.

American Made for American Trade

NEW DEPARTURE

Ball Bearings Throughout and Why



BY the use of New Departure ball bearings throughout the entire Chassis, the manufacturer of this car has reduced power losses, repairing and operating costs to a minimum.

New Departure ball bearings eliminate friction. Friction is expensive, wears away the parts, hastens depreciation, and makes frequent repair necessary.

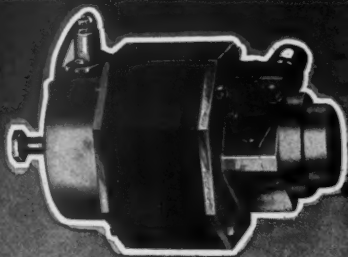
By eliminating friction New Departure ball bearings waste so little of the motor energy that maximum driving power is transmitted to the rear wheels. By eliminating friction there is practically no wearing away of the parts. The life of the entire car is longer and repairs are fewer.

All of these advantages are secured without sacrificing bearing efficiency. New Departure ball bearings will carry the load under all conditions of service equally as well as any bearing made.

Have you seen our interesting brochure on "Friction Elimination"? If not, drop us a card today and it will be forwarded to you by return mail.

NEW DEPARTURE MFG. CO., Bristol, Conn.

Western Branch, 1016-17 Ford Bldg., Detroit, Mich.



BAILEY

ELECTRIC SYSTEM

The Coming Light

With the arrival of the perfect electric generator, electric lighting for motor cars is unquestionably displacing all other forms.

Electric generators have heretofore been subject to criticism on account of their inefficiency and unreliability.

The Bailey Electric Generator, a wonderful dynamo only $5\frac{1}{2}$ in. high, $5\frac{1}{2}$ in. wide and $7\frac{1}{2}$ in. long, weighing 17 pounds, designed by Benjamin F. Bailey, the famous Electrical Engineer, furnishes the first logical solution of the electric lighting problem.

In its construction, all unsatisfactory and trappy devices, such as reverse current relays, magnetic switches, vibrating contacts, delicate rheostats, slipping clutches, corroding platinum points and other trouble making appliances have been entirely eliminated.

Furthermore, there are no moving parts involved in the Bailey System of Regulation.

A patented mercury switch, the very simplicity of which has foiled other inventors, makes the construction of this generator so simple and compact, that in spite of the fact its output running from 10 to 15 amperes is almost double that of other generators, the entire mechanism is little larger than a man's hand.

Another thing—due to its peculiar construction, when the big headlights are thrown on, it automatically supplies the additional current required for their lighting.

You are always assured of brilliant lights on all your lamps, and a sufficient reserve in the battery to take care of emergencies.

Prices of Complete Outfit

Model L 1, suitable for car lighting systems requiring 60 candlepower or less, \$75.00

This price includes generator, wiring, harness, 60-ampere hour storage battery and all controlling switches ready for installation. Price f. o. b. Grand Rapids.

Model L 2, suitable for car lighting systems requiring 60 to 100 candlepower, \$125.00.

This price includes generator, wiring, harness, 80-ampere hour storage

battery and all controlling switches ready for installation. Price f. o. b. Grand Rapids.

The above outfits can be attached to any existing type of car having an exposed rotating shaft on the power plant.

Send for our Booklet, "Electric Lighting Explained," which shows in detail how the generator is made and what it will do. Also describes the Bailey Combination Ignition, Starting and Lighting Unit.

WILSON & COSGROVE—Exclusive Sales Agents

Suite 6—Goldberg Building,
DETROIT, MICH.

THE BAILEY ELECTRIC CO.
GRAND RAPIDS. MICHIGAN, U.S.A.

When Writing to Advertisers, Please Mention Motor Age.



Actual Size of A.V. Shock Absorber and Shackle

THE SHOCK ABSORBER THAT HAS SUPERSEDED ALL OTHERS IN EUROPE

The **A.V.**

(A. Vermersch & Cie.)

Hydraulic-Spring Shock Absorber

INCLUDING THE BEST FEATURES OF
ALL ABSORBERS WITH CERTAIN
IMPORTANT ORIGINAL
FEATURES.

\$35 per pair and up

Made for both front and rear

The A.V. SHOCK ABSORBER is only 6" high and made in diameters to suit the weight of the car.

They take the place of your spring shackle without any special attachments.

An opportunity to handle the A. V. SHOCK ABSORBER is now open to dealers and jobbers throughout the country.

A complete line of sizes specially constructed for commercial vehicles.

HUDSON EXPORT & IMPORT CO.
140 West 42nd Street New York City

RHINELAND MACHINE WORKS
1254 Michigan Avenue, Chicago, Illinois 650 Woodward Ave., Detroit, Michigan

JOHN V. WILSON CO.
1424 Vine Street, Philadelphia, Pa. 220 Pleasant Street, Boston, Massachusetts

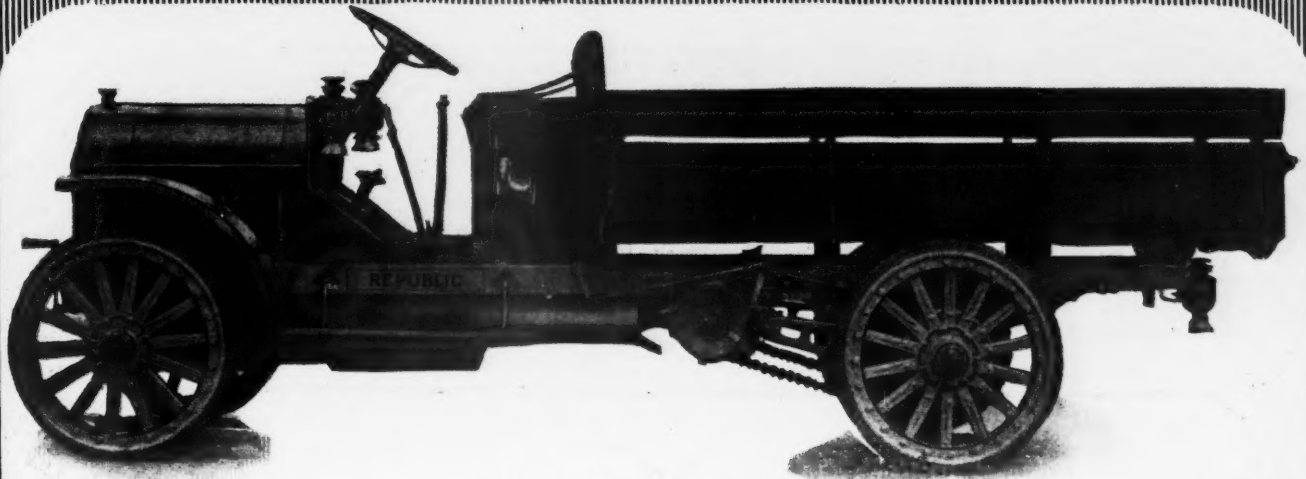
When Writing to Advertisers, Please Mention Motor Age.

REPUBLIC

1500-
-2000
POUNDS
CAPACITY

\$1425.

**WHERE CAN YOU GET
as MUCH for so LITTLE?**



YOU can't dodge this conclusive fact—that in the REPUBLIC you get more value, dollar for dollar, than in any other truck on the market—and you get **more** in service no matter what price you pay. In what other truck—at anywhere near the REPUBLIC price—will you find all of the following high-standard features?

| | | | | |
|---------------------|----------------------|----------------------|------------------|-----------------------|
| Continental Motor | Schebler Carburetor | Left Hand Drive | Lewis Springs | Bower Roller Bearings |
| Covert Transmission | Culver-Taylor Chains | Gemmer Steering Gear | Eisemann Magneto | Center Control |

You know all these parts. You've read about them. You know that these are produced by **specialists**.

Again, we ask you, where can you find a dependable, economical truck, with all these high-grade parts, and, in addition, a stake, or express, body for \$1425?

WRITE FOR OUR LITERATURE TODAY

DEALERS Think for a moment of all the splendid, convincing talking points that there are in the above specifications. The entire truck is every bit as good as its individual parts. Prove it for yourself. Get in touch with us—NOW.

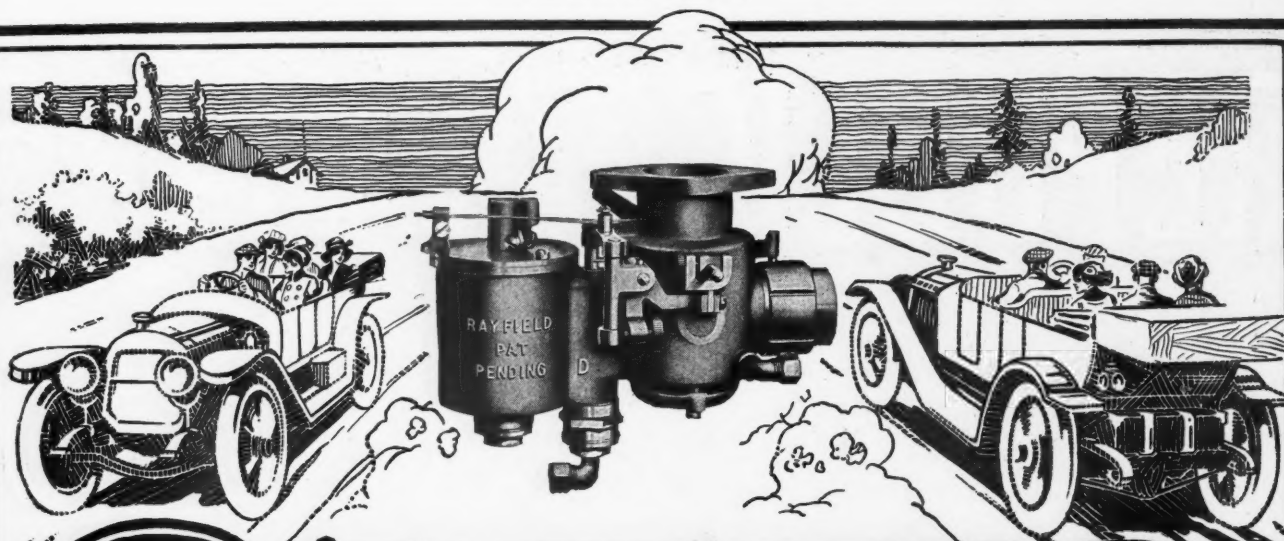
"Republic Means Service"

Alma Motor Truck Company

General Sales Offices
870 Woodward Avenue
DETROIT, MICH.

113-1

When Writing to Advertisers, Please Mention Motor Age.



RAYFIELD

CARBURETOR

Has Always Been Right

The correct principles of carburetion were embodied in the first Rayfield.

Hence it has not been necessary to make important alterations in the design or operation of this carburetor.

To our determination to be right in the beginning, the Rayfield owes its reputation of today, and the advance it has made over carburetors that were in the field long before it appeared.

And because the Rayfield was correct in design, construction and operation, it develops the greatest economy, the greatest flexibility, the greatest power and the greatest speed of which a motor of given size is capable.

Rayfield records on the track are the most

conspicuous, perhaps; but the Rayfield records of satisfied users—men who will always be Rayfield users, no matter what car they drive—are the ones for you to consider.

Because, it is in every-day, year-round use that the Rayfield has shown unexcelled capacity for economy, for operating in wide ranges of temperature and altitude without change of adjustment.

These are the features you ought to know about, whether you are a manufacturer, dealer or car owner.

There are thousands whose experience has convinced them that the Rayfield is far and away the best carburetor for them to fit to their cars, to sell and to use.

Your first step toward the Rayfield army would be investigation, and we only ask you to investigate.

Findeisen & Kropf Mfg. Company, 21st and Rockwell Sts. **Chicago**

(BRANCHES:

1140 MICHIGAN AVE., CHICAGO. 1211 WOODWARD AVE., DETROIT. 1902 BROADWAY, NEW YORK

Stewart Speedometer

MAGNETIC PRINCIPLE

The most important miles on the dial

One of the most important speeds a car *must* maintain—and must have indicated *exactly* in order to maintain—is the low speed required by city traffic rules which is often as low as 6 miles per hour.

The *only* instrument that indicates these low speeds is the *magnetic type* speedometer.

No other speedometer shows any sign of life until its whirling parts have enough momentum—never under seven to fourteen miles per hour.

The magnetic Stewart begins to register when the car begins to move. It accurately and unfailingly indicates speed *from zero up*. It is the only speedometer which surely indicates every mile or fraction below fourteen miles—the most important miles on the dial.

This is another reason for the 800,000 Stewart Speedometers in use compared to the 200,000 of all other makes combined.

See that you have a Stewart on *your* car.

The Stewart Speedometer Factory

1931 Diversey Blvd.

Chicago, U. S. A.

Service Stations in all important cities all over the world

The most popular Speedometer in the World

When Writing to Advertisers, Please Mention Motor Age.

Territorial Agents

iNVA OIL

Clearer



FACTORIES:
 NEW YORK.....92 Pearl St.
 PHILADELPHIA.....113 Arch St.

BRANCHES:
 BOSTON.....284 Columbus Ave.
 WASHINGTON.....3627 New Hampshire Ave., N. W.
 PHILADELPHIA.....113 Arch St. and 719 N. Broad St.

INVADER

Lessees of Chas.

Main Office, 79 Broad

When Writing to Advertisers, Please Mention Motor Age.

Agents Wanted

DEER OILS

Cleanest

OIL CO.

F. Kellom & Co.

Street, New York

TERRITORIAL AGENTS:

BOYER-CAMPBELL CO.....Detroit, Mich.
BECK & CORBITT IRON CO.....St. Louis, Mo.
MOTOR CAR SUPPLY CO.....Chicago, Ill.
LEE HARDWARE CO.....Salina, Kan.
AMERICAN LUBRICATING & SUPPLY CO.,
Kansas City, Mo.
JAMES BAILEY COMPANY.....Portland, Me.

When Writing to Advertisers, Please Mention Motor Age.



KINGSTON

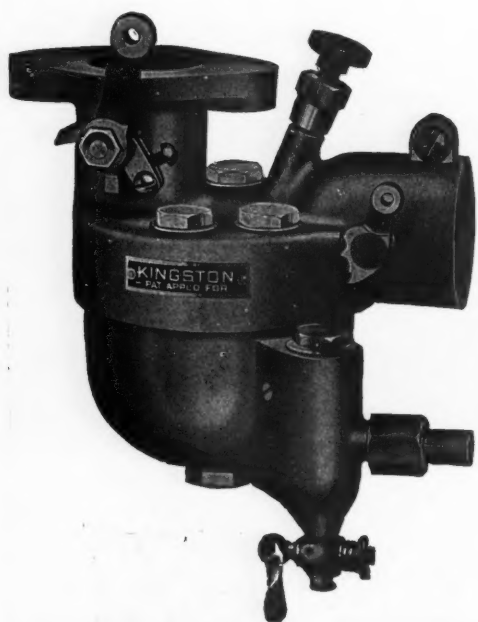
New Model "Y" Cures Car Cussedness

Did it ever occur to **you** that it's **your** fault as much as your carburetor's if your motor won't throttle down, misses on high, misses on low?

Did it ever occur to you that it's **your** fault if your carburetor persists in giving you small mileage per gallon of fuel—persists eternally in getting out of adjustment?

Did it ever occur to you that you don't have to tinker, tinker, tinker everlastingly—that you can throw your trouble away—and in a few hours' time install a satisfactory, trouble-proof, economical KINGSTON—THE AUTOMATIC CARBURETOR?

Did it ever occur to you that thousands of satisfied KINGSTON equipped motorists have found this out to the everlasting benefit of their cars, tempers, pocket-books, and motoring pleasure?



Did the reason for this ever occur to you—the unique construction of KINGSTON carburetors—the four floating, bronze ball valves opening **automatically** at different motor speeds—the various shaped ball seats—the concentric principle—the single adjustment—the cup-shaped fuel nozzle? **Post yourself!**

Our Service Department will put you on the right track to perfect carburetion. Write us.

*Made by the oldest manufacturers of Carburetors in America
ESTABLISHED 1895*

BYRNE, KINGSTON & COMPANY, Kokomo, Indiana

BRANCHES:

CHICAGO....1430 Michigan Ave.
DETROIT....650 Woodward Ave.

NEW YORK.....1733 Broadway
LOS ANGELES...804 So. Olive St.

The Ideal Combination

The New Way

The Brown Impulse Tire Pump WITH The B'Co. Quick Detachable Spark Plug

Here's a new outfit that removes the last possible objection to the Impulse Tire Pump—the trouble of removing the old fashioned spark plug and the danger of breakage.



The Old Way

THE BROWN PUMP

Made from best gray iron with lapped piston rings. Inflates to any desired pressure in from one to four minutes. Registers the exact pressure, insuring exactly the right inflation. (More tires are ruined from under inflation than from any other cause.)

Pumps Nothing But Pure Cool Air

Saves time, strength and temper. Makes the most disagreeable task connected with automobiling a real pleasure.

THE B'CO. QUICK DETACHABLE SPARK PLUG—
Furnished **Free** with every Brown Pump.

Attaches and detaches without a wrench. Just a twist of the wrist and the core lifts out. The pump drops in and seats securely with a quarter turn.

Your two hands and two seconds of time do the trick. No fuss, no trouble, no broken spark plugs.

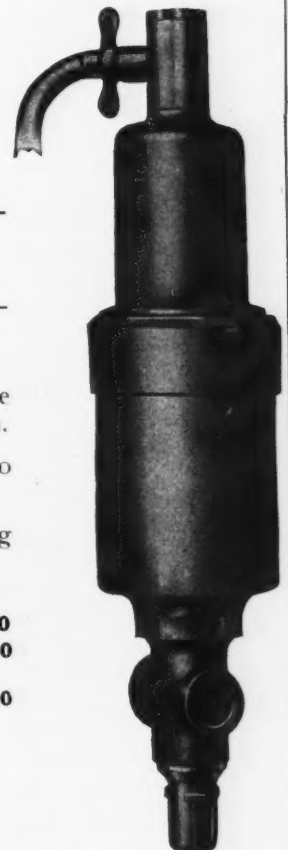
Made for the Brown Pump, but the most convenient and durable plug for use under any and all conditions.

| | |
|--|---------|
| Brown Pumps complete, including 12 feet hose, self-opening valve connection, high-grade recording gauge, and B'Co. Q. D. Spark Plug..... | \$15.00 |
| Extra Spark Plugs..... | 1.50 |
| Previous models of Brown Pump made over to fit this new connection, including plug | 2.00 |



The Spark Plug

Ask your dealer to-day about this wonderful time and temper saving outfit. If he can't tell you write us.



The Pump

THE BROWN COMPANY, 120 BELLEVUE SYRACUSE, N.Y.

"American" Axles

Combine The Most Efficient Worm Gears Known, With Full Floating Axles Of The Highest Grade

The Lanchester-Daimler Worm Drive in a Full Floating "*American*" Axle, creates a unit whose exceptional merit is frankly recognized.

Motor car engineers have not given the Lanchester-Daimler first place among worm gears without sound reasons. They regard it as superior to all others in design, and pronounce it a triumph of manufacturing skill.

That it is—in practice as well as theory—the most efficient type of worm gear known, has been proved by numberless tests.

Since we acquired—nearly two years ago—sole rights as American axle manufacturers to its use, we have demonstrated its perfect adaptability to both Gasoline and Electric pleasure cars of the finest type.

"*American*" Lanchester-Daimler Axles, as a part of our regular product, show the same fidelity to the highest manufacturing ideals that is so evident in our Bevel Drive Axles.

They are fitted throughout with the best types of foreign made ball bearings.

Quality—not price—is the sole test of all materials employed in "*American*" Axles of either type.

THE AMERICAN BALL-BEARING CO., Cleveland, Ohio



Extra seats, making your commercial car convertible into bus or pleasure car

Pleasure Car Dealers! Fill in Your Slack Months Selling The Brown Commercial Car

Six months in every year—from August to December—pleasure car sales are at low ebb. You can tide yourself over this slack season by selling a truck that is in demand **all the year 'round**. You can "round up" truck prospects in the months you have little else to do—convince and sell them. All you need is the **right** truck at the **right** price.

The big demand today is for trucks of about 1500 lbs. capacity. Their upkeep is exceedingly lower—they wear out fewer tires and use less fuel—than trucks of greater weight. This is a big point to business men in the market for **rapid, economical** delivery service.

Note these Features

Long Stroke Motor.
Unit Power Plant.
Center Control.
Left-side Drive.
Internal Gear Drive.
Tubular Propeller.
Cushion or Pneumatic Tires.
Large Loading Space.

The BROWN COMMERCIAL CAR has 1500 lbs. capacity. Yet it is as powerful as a 1½ ton truck. Because its parts are as heavy and strong as those generally found on 1½ ton trucks it can be safely loaded far in excess of its capacity.

We have some good territory not yet assigned. Write or wire us for generous sales proposition.

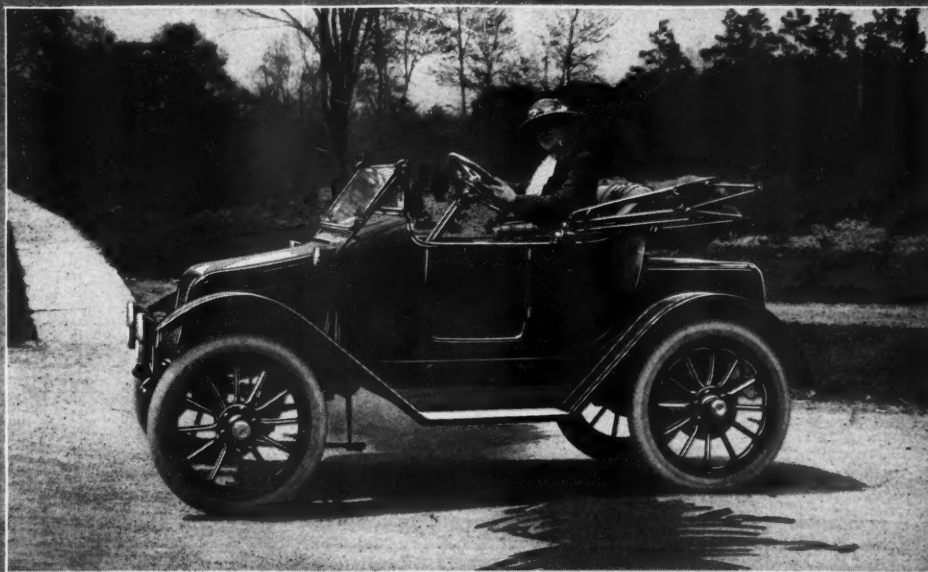
Let us send you full specifications and complete descriptions of this sales-pulling car.

Brown Commercial Car Co.
PERU, INDIANA

Indianapolis Office, 450 North Capitol Blvd.

Prices of Models

Chassis\$1650
Standard Express Body. 1775
Standard Express Body,
with top... 1825
Standard Express Body,
with screens 1850
Panel Body.. 1850
Stake Body.. 1800



The New Baker Electric Roadster Gives to the Dealer a Car that Appeals to Everybody

Its adaptability to all uses in town or country opens up for it a practically unlimited field. Men want it for business as well as pleasure. It is light and speedy and easy to handle. With the woman it is equally popular for doing her errands about town, attending to her social duties or running out into the country for an afternoon of healthful pleasure.

Above all the Baker Electric Roadster is Dependable

It is ready when its owner needs it. Its upkeep is inexpensive; its operative cost low. No chauffeur expense is entailed. The new Baker Roadster has either wheel or lever steer; 34-cell battery; standard Baker motor and shaft drive, famous for current economy; complete set of lamps; Weston Volt Ammeter; shaft odometer; kit of tools; Tuto horn; rain vision wind shield; side curtains; metal fenders curtained to frame. It is beautifully upholstered in blue leather, with gray-striped blue body and running gear.

There is a wide and profitable field for Baker

representatives. The simplicity, durability, cleanliness and convenience of Baker Electrics, their economy, speed and mileage radius, form an appeal to the average man and woman that gas car manufacturers are having trouble in meeting. The magnificent Baker Broughams, Coupes and Roadsters are winning their way.

If you are in a position to represent the magnificent Baker line as its prestige requires, we shall be glad to prove to you the sales possibilities of the Baker product as represented by this new model roadster. *Write us for our proposition.*

THE BAKER MOTOR VEHICLE COMPANY, CLEVELAND, OHIO

Canada: The Baker Motor Vehicle Company of Canada, Ltd., Walkerville, Ontario

Builders also of Baker Electric Trucks

Branches or Dealers in Principal Cities



1914 announcement of the pioneer builder of the moderate-priced "Six"

In making this first announcement of the 1914 Havers 6-60 we wish to address ourselves particularly to dealers well established in their territories and their communities, and who have the ability and the facilities to sell a "six" of the high type represented in the Havers.

For such dealers we believe the Havers to be an especially interesting car, because of its high quality, its great power, the worth and reputation of its component parts, its equipment, and the reasonable price at which such a car can be sold with fair profit to dealer and maker.

We further believe that the dealer who is a good business man, and who is looking to the future of his investment, will agree with us when he knows the Havers car.



*Note the wealth of
instrument board
equipment and the
two hooded elec-
tric lights*

Now in its fourth year, the Havers has made substantial progress and substantial success in the past.

We were the first builders in America to produce a six-cylinder car under \$3000.

We paved the way for other sixes, by showing that a moderate-priced six can be made a success.

The Havers has always welcomed comparison in every detail with cars of its class; and if we could make the statement stronger with reference to the 1914 product, we should do so.

Mechanically there is no change in the 1914 cars over those of the past season, simply because we could find no place where change meant improvement or greater efficiency.

In the matter of accessories and equipment, we believe no car—at any price—has ever been so completely fitted as the Havers 6-60.

Havers dealers had no trouble disposing of all of the 1913 product we could supply; and the 1914 car has been made even more salable to that class of buyers who demand a complete car of the highest grade.

We shall be glad to correspond with dealers to whom such a car presents an opportunity.

**Havers Motor Car Co.,
Port Huron,
Michigan**

A car that will sell to men who formerly



Details of the 191

FRAME—Double drop pressed steel, heavy channel section, width 30 in. in front, 31½ in. in rear. Metal 7/32 in. thick.

WHEEL BASE—128 inches.

DRIVE—Propellor shaft carried in torsion tube with full universal and slip joint on transmission shaft. Driving strain on rear axle carried through radius rods. Torsional strains carried through frame by a large yoke on third member.

AXLES—Front axle drop forged "I" beam section with drop forged yokes, spindle 1½ in. in diameter. Rear axle full floating. Drive shaft 1½ in. nickel steel.

BRAKES—Service brake, external contracting. Emergency brake, internal expanding. Both lined with Raybestos and equipped with equalizers. Drum 16 in. diameter, 2½ in. wide.

STEERING GEAR—Worm and full wheel type, irreversible and adjustable for wear. Heavy nickel 2 in. diameter steering column, 18 in. steering wheel.

WHEELS—Wood, artillery type. Spokes of best second growth hickory. Firestone quick-detachable, demountable rims. McCue wire wheels optional, \$50.

TIRES—36x4¼ in., front and rear.

TREAD—56 inches.

SPRINGS—Front, semi-elliptic, 40 in. long by 2 in.

There is a class of men who demand the highest quality in their cars, but are perfectly willing to take a saving in the purchase price.

To such men the Havers 6-60 makes its strongest appeal.

It offers the quality, the stability and the engineering skill embodied in the costliest cars.

It offers the same high power, the same efficiency in road work.

It offers the same silence of operation; the same convenience; the same comfort.

And in equipment—the big things and the little things that every man likes to have on his car—it goes far ahead of any and all of its contemporaries.

And there is another class to which the Havers makes an appeal almost equally strong.

This class is made up of the men who have tried the cheap six.

The men who have found their cars under-power for their weight; "up against it" on the hills; hard-riding and generally unsatisfactory; yet who appreciate and want the advantages of good six-cylinder construction.

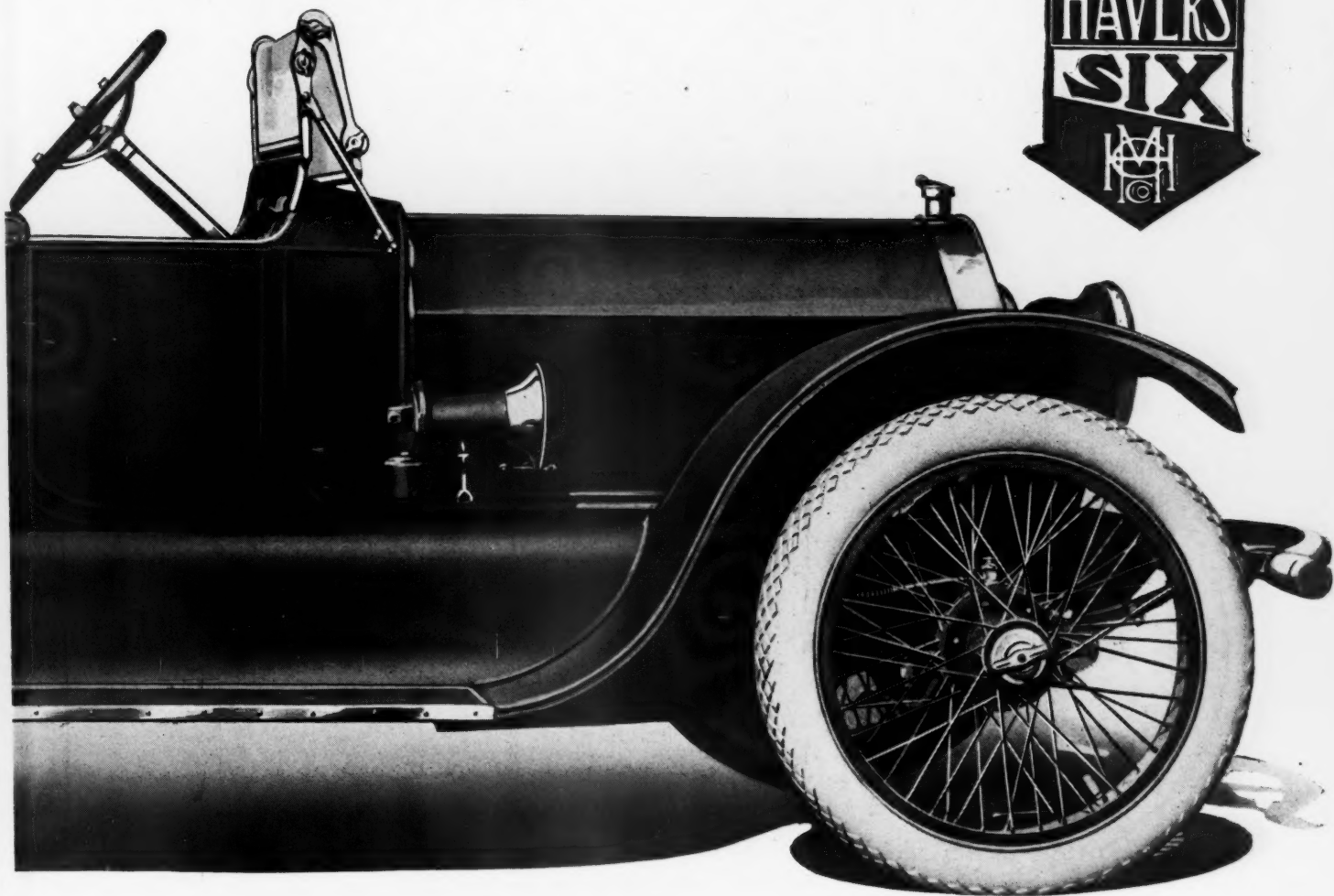
In both of these classes are the men who will be buyers of the Havers 6-60 in 1914.

We speak of the Havers as a car of the highest quality because of the reputation and standing of the manufacturers who supply its various units.

The motor is the Continental—the finest product

Havers Motor Car Co.,

paid the highest prices for Sixes



ne 1914 Havers 6-60

wide. Rear, platform. Sides, 46 in. long by 2 in. wide. Cross, 36 in. long by 2 in. wide.

CONTROL—Hand gear change lever and emergency brake lever at driver's right, inside body; service brake, right foot pedal; clutch, left foot pedal; foot accelerator.

OIL CAPACITY—8 quarts.

GASOLINE CAPACITY—20 gallons, with 10-gallon storage tank at rear. Force feed, air pressure maintained by pump driven by motor.

STANDARD COLORS—Regal blue or Brewster green.

STANDARD EQUIPMENT—Cowl board on which will be assembled, flush with same; Warner speedom-

eter, eight-day clock, gasoline gauge, air gauge, ammeter, volt-meter, 4-gang double button lighting switches, two dash lights, new design full nickel windshield of the highest quality, Tonneau light, trouble light with cord, robe rail bag with four compartments, toilet articles in one. High grade top, complete set of slip covers, including top dust boot of the same material, license brackets—front and rear, foot scrapers for running board, new type double rear tire irons, power-driven tire pump, Klaxet electric horn, heavy steel truss rubber cushion front bumper, oil can holders, North-East system for electric starting and lighting.

PRICE—Fully equipped f. o. b. Port Huron, Mich., \$2485. Two folding tonneau seats, \$50. Wire wheels, \$50.

from the oldest plant in America making high-grade motors.

Its horsepower is 60—one to each 60 pounds of car weight—which we believe to be a higher power and weight proportion than found in any other six.

Weston-Mott axles, front and rear, are the guarantee of axle soundness.

Transmissions are from the Warner Manufacturing Company; universal joints are Spicer; bearings Hess-Bright and Hyatt; Warner steering gears.

This roll of honor is a big selling point; for, as you know, these parts are the best that money can buy.

Port Huron, Michigan

In the Havers they are combined harmoniously by the highest engineering skill we can command.

So here, in the vitals of the car, you have every element that makes for quality in the finished product.

Moreover, when you have sold a Havers car, you have sold the most completely equipped car on the market.

Your buyer is required to add nothing; you are required to add no equipment item at your own expense.

Seat covers, front bumper, electric horn, power-driven tire pump, oil can holders, tire irons—everything is on the Havers 6-60.

Let us hear from you at once if you believe you can sell the Havers 6-60.



The 6-44—a splendid running mate for the larger Havers

Our enthusiasm for the Havers 6-60 is shared by this car's splendid running mate, the 6-44, at \$1985.

This is a car that has made an unassailable place for itself by its steady and consistent performance.

It is the direct lineal descendant of the first Havers; and has never failed to uphold the good name of the line.

Its motor is rated at 44 horsepower, which, in proportion to the weight of the car, is more than ample.

So here, in a six, is a car priced no higher than a high-grade four, and which carries out to the perfection of present development the advantages of six cylinders over four cylinders.

As we have already said, the Havers

Motor Car Company has had three substantially successful years.

We feel that our success has been due to three elements—the car we build, the organization we have perfected, and our policy of conservatism and service to owners.

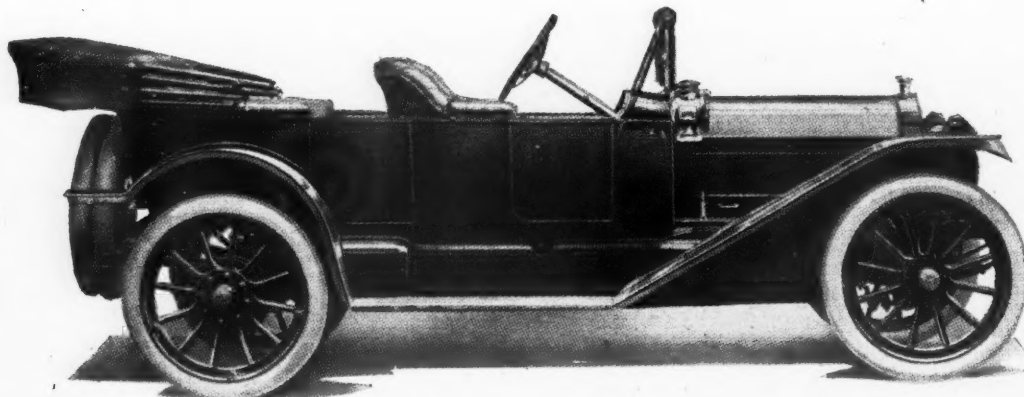
We feel that the good dealer appreciates methods of the sort we pursue.

And that we are correct in this is evidenced by the inquiries about 1914 cars that have reached us prior to any public announcement.

We have room for more dealers; our output is to be increased for 1914.

We would like to hear from you without delay if the Havers line presents itself to you as an opportunity for 1914 and following years.

Havers Motor Car Co., Port Huron, Mich.



Havers 6-44—Five-passenger Touring Car. Wheelbase 122 inches. Electric starter and lights. Top, windshield and speedometer.....Price \$1,985



32 Manufacturers Adopt Jiffy Curtains As Regular, Standard or Optional 1914 Equipment

Never before in the history of the automobile industry has there been such a quick and almost universal endorsement of an automobile accessory as in the case of Jiffy curtains. In the short period of one year, over 100,000 motor cars have been equipped with Jiffy curtains, and their successful operation has demonstrated conclusively that the old-fashioned side curtain has gone forever.

You can have Jiffy curtains upon your \$500 car or your \$5,000 car—32 of the most successful automobile manufacturers have adopted them as regular, standard or optional equipment for the year 1914.

Motor Cars "Jiffyquipt"

ABBOTT-DETROIT
CHANDLER SIX
COLUMBIA-KNIGHT
FRANKLIN
HUPMOBILE
HOWARD-SIX
HUDSON
HAYNES
KEETON
KNOX
LEXINGTON
LOZIER
LUVIERNE
MAXWELL
OAKLAND
OLDSMOBILE
PILOT
PACKARD
PAIGE-DETROIT
PIERCE-ARROW
R-C-H
STUDEBAKER
SPEEDWELL
STEVENS-DURYEA
TRIBUNE
WHITE
WINTON



Protected by Basic Patents

Jiffy Curtains are protected by some of the strongest basic patents ever issued by the United States. Any infringement of these patents will be prosecuted to the fullest extent of the law.

Auto Curtains Should Always Be Carried Flat

In order to protect the lights in any auto side curtain, it is absolutely necessary that they always be carried flat.

When curtains are rolled up, like the old-fashioned way, the lights soon become set in a curved position and the constant unrolling of same for installation upon the car will result quickly in broken lights which renders the curtains useless until repaired.

Such disaster can never come to Jiffy curtains, because they are always carried flat. Their accordion plaited formation of uniform lights prevents breaking, and the curtains themselves are always kept clean and intact when not in use and stowed away in the top. The careful buyer of any motor car will investigate the type of side curtains offered, and ultimately purchase a Jiffy equipped car.

The illustration above shows lights with rounded ends, although square or oval ends may be used with equal effectiveness.

The number of panel lights varies with the particular engineering practice of the different manufacturers.

SEND FOR DESCRIPTIVE LITERATURE

Manufacturers

Our royalty license proposition, enabling you to equip your car with Jiffy Curtains especially designed for it, should interest you. It has interested many of your competitors.

JIFFY AUTO CURTAIN CO.

General Sales Office
Detroit, Michigan
Dodge Power Bldg.

Top and Curtain Makers

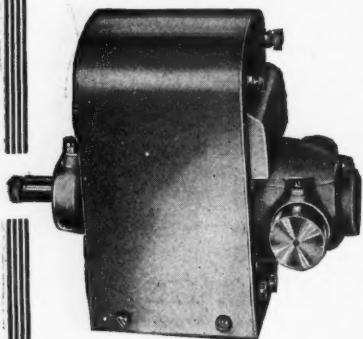
Thousands of car-owners will welcome the chance to equip their present car with Jiffy Curtains.

Our Royalty license proposition enables you to fill this demand profitably.

When Writing to Advertisers, Please Mention Motor Age.

The Car Without Electric Lights Is Plainly In The Back Number Class

Increase the efficiency and decrease the expense of lights by installing a (*genuine*) Wells Generator.



So doing, you increase also the value of your car and the pleasure of driving it. The

Wells Generator

will outlast the best automobile made, owing to its light weight and sturdy construction which protect it from damaging shocks.

But the best thing about the WELLS GENERATOR is the MAGNETIC SHUNT which only the genuine WELLS has.

This Shunt is the thing that has earned the reputation of the genuine *Wells* as the only generator which *always* makes current enough and *never* too much—*because it can't*.

The MAGNETIC SHUNT is *not an added contraption* to control the current after it is made. It is as much an essential part of the genuine Wells as the main bearings are. It controls the *actual output of the generator itself* by controlling the lines of force in the field magnets.

The SHUNT is as strong as the hinges on the court house door and no more able to get out of order.

And so today, just as "lights" means *electric lights*

To the Wise Buyer, Electric Light Means:
"Buy a WELLS GENERATOR"

To the Wise Dealer, Electric Light Means:
"Sell the WELLS GENERATOR"

To *Both* It Means: "Write us, quick."

To Everyone Who Owns A FORD:

"Be Good To Your Little Car!"

Get it what it needs, a (*genuine*)



Wells Master Vibrator

How do you expect to know what your engine can give you if you deliver it sparks in "ragtime" and drive yourself into nervous prostration trying to keep four adjustments in tune? With the WELLS you get a real ride over the hard and the easy alike. *Try it. It doesn't cost much.*

Write for name of dealer near you

R. C. Wells Manufacturing Co.

Fond du Lac, Wells Building, Wisconsin

Look at the Speedwell Six from any angle. You'll find it the most remarkable motor car value of today.

Four and Five Passenger Models, \$2850

Seven Passenger Model, \$2950

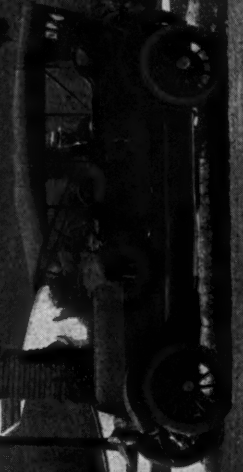
Electric Starting and Lighting—Fully Equipped

LITERATURE UPON REQUEST

THE SPEEDWELL MOTOR CAR CO., Dayton, Ohio



Seven Passenger



Four Passenger



Five Passenger

Overland

THE motor is *larger*; the wheelbase is *longer*; the tires are *larger*; the tonneau is *roomier*; the equipment is *better*—including such costly additions as *electric lights*; the body is *more handsomely finished*, in rich dark Brewster green, with heavy nickel and aluminum trimmings. In fact, in every single and individual respect this is an *improved* car at a *reduced* price.

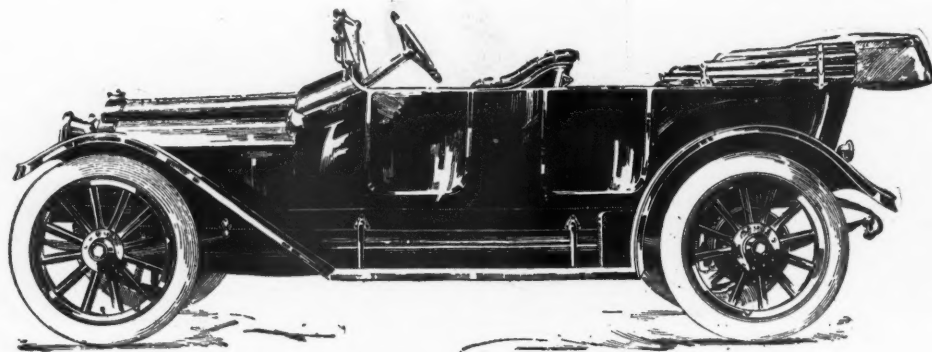
\$950 Completely Equipped

With Gray & Davis Electric Starter and Generator—\$1075, f. o. b. Toledo

35 horsepower
114-inch wheelbase
Electric head, side, dash and tail lights
Timken bearings
New Splitdorf magneto

Model R Schebler carburetor
Three-quarter floating rear axle
33x4 inch Q. D. tires
Cowl dash
Turkish upholstery
Genuine, hand buffed leather

Clear-vision windshield
Mohair top, curtains and boot
Stewart speedometer
Electric horn
Flush U doors with disappearing hinges



1914 Catalogue on request. Please address Dept. 46

The Willys-Overland Company
Toledo, Ohio

World's Stock Champion.
Fastest Stock Mile

National

World's Fastest 500
Miles in Competition

One question in a million brains

Everywhere men are asking the same question YOU are asking yourself: "What is to be the future of the motor car business?"

Stronger and stronger glares the spot light of truth on the situation. More and more the public sees and realizes the truth. The answer to the question is found today in the PUBLIC CONFIDENCE. Opinions may differ in details, but the fact remains that the manufacturer who has proven his honesty, sincerity, and his here-to-stayness is the one who is being elevated to the highest level of public confidence today.

The methods of manufacturers and their selling policies decide their measure of true worth—or lack of it.

The future of the motor car business is GOOD.

Good for what?

Good for the GOOD builder and GOOD dealer.

The public wants its money's worth; it wants to buy where it has confidence in the car builder, the car's reputation and the prestige and rating of the manufacturer. A car can rise no higher

than its source, its factory. A dealer can rise no higher than his car.

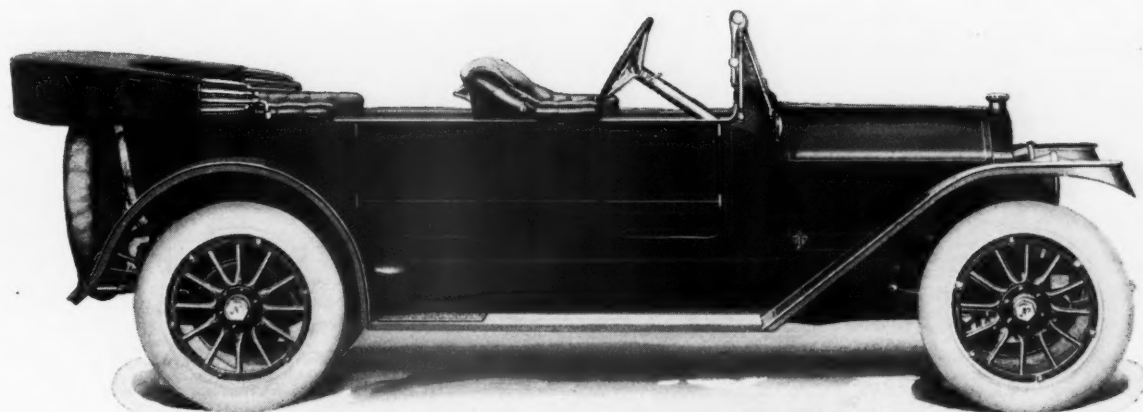
Catalog specifications, the paint on the hood, and salesman's speeches are futile if the car is lacking or the builders are not absolutely responsible and firm.

It is inevitable that the reputable builder with square methods of dealing with customers and who produces the greatest value in his cars, is the one who will have the confidence of the public. The NATIONAL wins business and customers for you.

We repeat: For a car of quality, power in abundance, speed in emergencies, dependability, reliable and always efficient service, perfect control, convenience and comfort, there is no better car built than the NATIONAL.

This is a matter of record, in tests and actual demonstrations of all kinds. This is guaranteed by a thirteen-year-old company with unimpeachable rating and good will. The NATIONAL company is stable; it is here to stay because it is right in its methods of giving the public the one service that counts—QUALITY.

The answer found in the *National* car



Improved series V-3—five models, \$2750 to \$3400—immediate delivery

National Motor Vehicle Co.

Indianapolis, Ind.



FOR YOUR TOUR



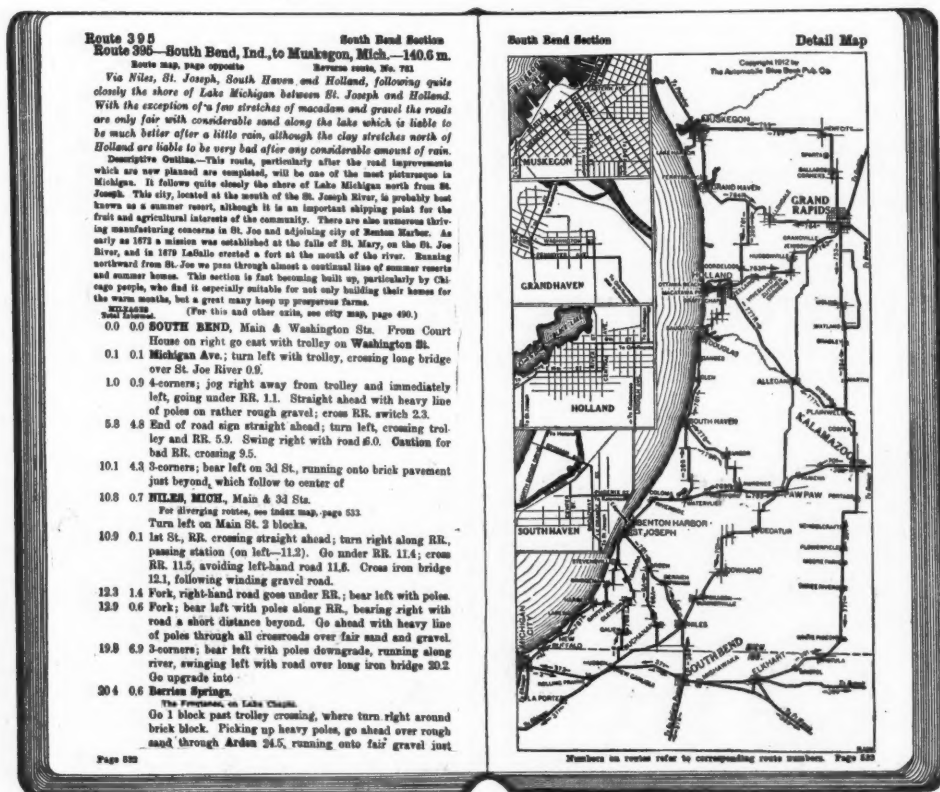
Do you realize that an accurate road guide is just as necessary to your comfort and convenience as an extra tire?

A reliable route book will save you an average one to two hours each day you tour, because you are saved the trouble of asking dozens of questions. Furthermore, with a good guide you are able to plan in advance your whole trip, know accurately all road conditions, mileages, noon and night hotel and garage accommodations.

The Official Automobile Blue Books are the only guides fulfilling all these requirements, and with the complete set you can cover the whole United States and the tourable sections of Canada.

- Volume 1—New York and Canada.
- Volume 2—New England and Maritime Provinces.
- Volume 3—New Jersey, Pennsylvania and the Southeast.
- Volume 4—The Middle West.
- Volume 5—Mississippi River to Pacific Coast.

—\$2.50 The Volume—



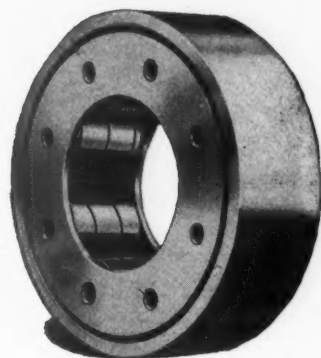
Here are two specimen Automobile Blue Book pages, one-half actual size. The combination of maps and road-data will be appreciated at a glance. Distances and landmarks are noted down to the tenths of miles—the motorist's odometer is his compass. And all routes are indexed, under an ingenious system that gives ready access to the information desired. The finished product of a decade's experience.

Book Dept., CLASS JOURNAL CO., 910 S. Michigan Ave., Chicago, Ill.

When Writing to Advertisers, Please Mention Motor Age.



HYATT QUIET BEARINGS



The enormous strains and stresses set up in the reciprocating parts of a motor car traveling at even a moderate speed over ordinary roads impose a severe duty upon the bearings of the transmission and axles.

In a solid roller or ball bearing this duty is in the nature of a "dead shock" or load that causes undue wear and noise and has to be absorbed by the surrounding mechanism.

The Flexible feature of the Hyatt Roller Bearing cushions the shock, absorbs vibration and relieves the shafts and gears of excessive strain.

The durability of the Hyatt Roller Bearing is further increased by rigidly testing the high-grade alloy steels used in them. These tests are so thorough and comprehensive that the possibility of any weakness or defect in the bearing is reduced to a minimum.

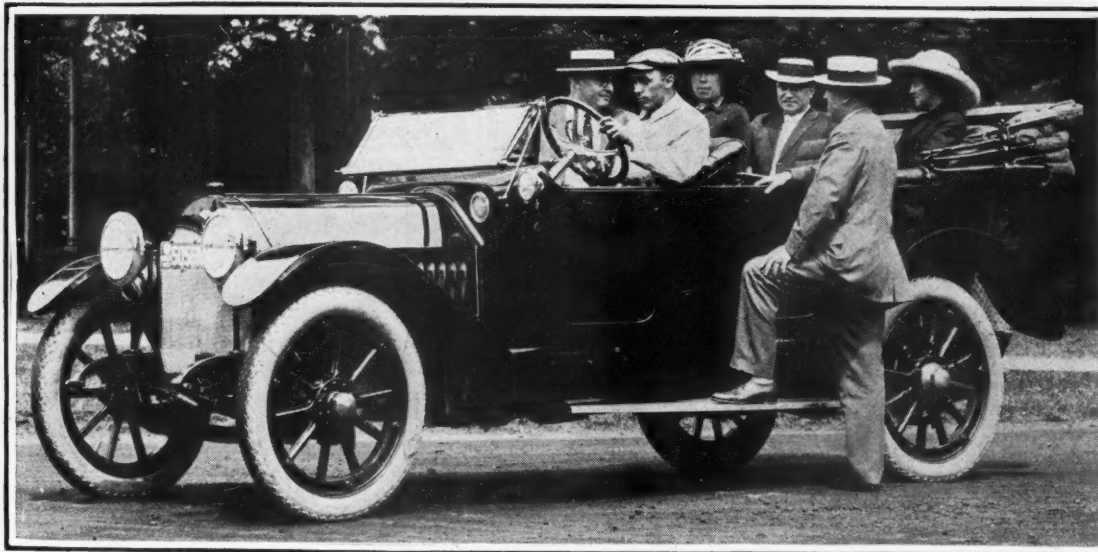
HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

CHICAGO ILL. NEWARK N.J.

When Writing to Advertisers, Please Mention Motor Age.



Here's the Beauty!!!



BELLE ISLE { 50-60-Six Cylinder, 130 inch Wheel Base.
Price \$2190 F. O. B. Detroit.
Top, Top Boot, Windshield, and Stewart-Warner Clock Speedometer \$100 Extra.

The name to tie to for the **TEN CARDINAL POINTS** of automobile **VALUE**

Abbott-Detroit

STYLE

To attract the prospect.

HIGH QUALITY MATERIALS AND WORKMANSHIP

To convince the investigating buyer.

STRENGTH

To stand the knocks.

POWER

To negotiate the roads.

SPEED

To "get there" and "back again."

COMFORT

To delight the ladies.

EASE OF CONTROL

To enable any one to drive it.

LOW COST OF OPERATION

To satisfy the careful owner.

SERVICE AND CO-OPERATION

To help the dealer and driver.

NET PROFIT

To enable the dealer to stay in business for the future.

Dealers in unoccupied territory should get our direct factory proposition and make 10% more net profit than on any other line. Write us today for special offer.

| | | | |
|---------------------------------------|--------|---------------------------------------|--------|
| 34-40 4-cyl. 5-Pass. Touring | \$1685 | 50-60 6-cyl. 7-Pass. Touring | \$2190 |
| 34-40 4-cyl. 3-Pass. Roadster | 1685 | 50-60 6-cyl. 3-Pass. Roadster | 2190 |
| 44-50 4-cyl. 5-Pass. Demi-Tonneau ... | 1985 | Equipment—Top, Top Boot, Windshield | |
| 44-50 4-cyl. 7-Pass. Touring | 1985 | and Stewart-Warner Clock Speedometer, | |
| 44-50 4-cyl. 3-Pass. Roadster | 1985 | \$100 Extra for all models. | |

All models electrically started and lighted with independent dual magneto ignition.

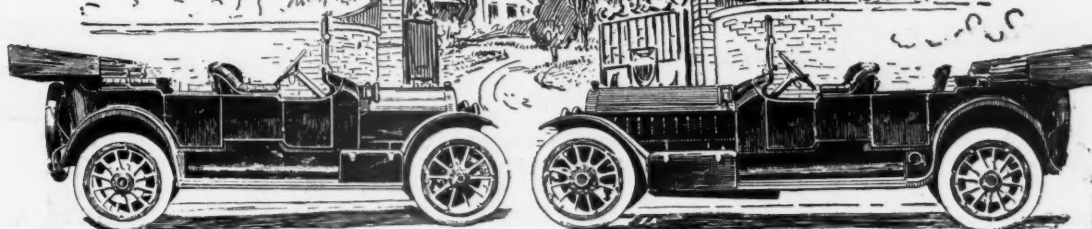
ABBOTT MOTOR CO., Detroit, Mich., U. S. A.

When Writing to Advertisers, Please Mention Motor Age.



The Easiest Riding Car In The World

MARMON



The Marmon "Thirty-Two"

Price, \$3,000. Four-cylinder, 32-40 h. p., 120-inch wheel base, body types and equipment to meet every requirement. A rational, logical car for touring and city use. Years of satisfactory service have proved its economy in tires, fuel and upkeep—plus smooth, delightful operation and durability.

The Marmon "Forty-Eight"

Price, \$5,000. Six-cylinder, 48-80 h. p., 145-inch wheel base with short turning ability eliminating the old objections to long wheel base. Body types and equipment to meet every requirement. The only big car with small car advantages. Wonderful riding qualities and surpassing power and flexibility. A car developed by years of exacting tests.

What the Dealers Said—

A FEW weeks ago we announced the Marmon cars for the coming season, and at the same time celebrated the sixty-second anniversary of this firm in the manufacturing business.

A number of dealers wrote us letters of congratulation on the remarkable records of the institution, of its products, and its business methods.

A big, vital message to every one interested in buying or selling cars is contained in these letters.

Read these expressions. They give you an actual insight into what the Marmon policy means to you.

1. "The writer has told several dealers that when a Marmon car is sold he does not have to go back every week to resell it to the customer, or talk him into believing that he is satisfied with his car. You can ask any person, I believe, in the United States about a Marmon car, whether he is interested in the automobile business or not, and he will tell you that the Marmon is a good car."

2. "I have never yet heard a knock or complaint from our owners or from our competitors in regard to the quality of a Marmon car or the responsibility of Nordyke & Marmon Company."

3. "The quiet elegance and excellence of design and construction of the Marmon cars have helped us to land the orders, and the backing we have received from Nordyke & Marmon Company by way of prompt and generous service has made it possible for us to retain our customers year after year."

4. "If every automobile dealer that you should wish to do business with could know you as we do, you could eliminate the expense of retaining your salesmen."

5. "We have today approximately 110 Marmon cars and we take care of them with a comparatively small shop force. We can show a letter of recommendation from the Marmon car from almost everyone of our owners."

"In all our dealing with your Company we wish to state that there has been the utmost fairness, and we do not believe an agent could sign up for a better car or with a better factory."

6. "We are proud of the Marmon account for many reasons. One is because we know it is your policy to build just as good an automobile as is possible to be built irrespective of cost. Another is, invariably when talking to the other dealers or ordinary laymen they will at once concede that it is one of the best machines built."

7. "During the time we have represented you here we do not believe that we have heard one derogatory remark about the Marmon."

8. "We have delivered in this vicinity since we have represented you almost two hundred Marmons. We are proud to say that not one of these customers has ever quit the Marmon after starting with us. We have not a large sales force working out of our store here. We at the same time feel that every one of these customers is in a way a salesman for us, as we know that there is not one of them that is not willing and trying at all times to further the Marmon interests."

9. "We find that our shop expenses and guarantee work amounts to practically nothing. You will appreciate this when I tell you that we have only two mechanics in our shop to take care of 200 cars."

Consider these points. They have a meaning for you.

Write for the letters and other proofs.

To the Dealer—the Marmon is better to sell because—

To the Buyer—the Marmon is better to own.

NORDYKE & MARMON COMPANY
INDIANAPOLIS (ESTABLISHED 1851) INDIANA

Sixty Years of Successful Manufacturing

When Writing to Advertisers, Please Mention Motor Age.

Every year, HALF A MILLION PEOPLE all over the world buy HERZ PLUGS ("Bougie Mercedes") at a higher price than they would have to pay for ordinary Plugs.

Do you think they are all foolish? They are the wise and really economical people of motordom. They have learned that a set of poor, cheap Plugs cost many a dollar, not only in renewals but in gasoline.

CAR
TYPE



\$1.50
postpaid or
from dealers

HERZ-PLUGS

\$1.50



MOTORCYCLE
TYPE

HERZ "Bougie Mercedes" PLUGS ignite the poorest mixture with current from the poorest Magneto. The four sparking points of Platinum-alloy, the unbreakable double-stone insulation, the self-cleaning construction—these are vital points of superiority.

Each HERZ PLUG is **GUARANTEED A YEAR** (Lasts 2 to 3 years.)

HERZ PLUGS are the result of twenty years of experience in Plug-making. There is not a weak spot in them.

Look for the Blue Enameled Stone

Ask your dealer, or write to **HERZ & CO., 295 Lafayette St., New York** Makers of the HERZ MAGNETO

Why Our Sales Increased Over 400% In Two Years

You Can't Beat This Equipment at Twice the Price

- 1—Automatic Dynamo Lighting System
- 2—Motor-Driven Tire Pump
- 3—Unit Power Plant
- 4—Long Stroke Motor with Enclosed Valves
- 5—Center Control
- 6—Left Side Drive
- 7—Electric Side Lamps in Dash
- 8—Electric Head Lights and Tail Lamp
- 9—Westinghouse Electric Self-Starter
- 10—Floating Rear Axle with Pressed Steel Housing
- 11—Demountable Rims (Baker Bolted-on)
- 12—118-inch Wheel Base
- 13—Goodyear No-Rim-Cut Tires

Glide

THE approval of dealers—the approval of users—has given the *Glide* car a remarkable boost in sales and popularity during the last two seasons. This approval, for one thing, is founded on the fact that the *Glide*—from radiator to tail light—lacks nothing essential to the performance of the car or the comfort of the passengers; that it has **strength** (endurance) to take steepest hills, go over all sorts of roads without wavering; that it has **power** (speed) ample to keep it ahead of the crowd, and plenty in reserve; that it has **appearance** (lines and finish) which places its value far above the low price asked for it.

Another thing, the *Glide* appeals to both classes of buyers—the man who wants a better car at a lower price—the man who wants a car he can be proud of, regardless of price.

Dealers Are Invited to Write Us for agency in their locality. The selling possibilities of the *Glide* are tremendous for the simple reason that a *Glide* dealer has a car that his competitor can't touch in quality or price. Catalogs free.

THE BARTHOLOMEW CO. 215 GLIDE STREET PEORIA :: ILLINOIS

\$1840

Write
Us
for
Agency



Model 36-43, Five-Passenger Touring, Fully Equipped. With Electric Self-Starter.

When Writing to Advertisers, Please Mention Motor Age.

A Big Opportunity For a Real Factory Manager!

¶ A medium sized, well financed and long established automobile company in Indianapolis has an opening for a thoroughly competent factory manager.

¶ Must be a man with a proven record with successful company and willing and able to take real responsibility. Will be given an interest in business when his ability and permanency are shown.

¶ This advertisement is intended to appeal to a man who is now doing really constructive work for which another is getting credit.

¶ Give full history and present connection in first letter; correspondence will be kept strictly confidential and returned if desired.

Address X.Y.Z., Care of Columbia Club, Indianapolis, Ind.

Why don't you own the vulcanizer you're paying for?

Yes, actually paying for it in tire service that you might have—but don't get. You know what happens when you let a casing cut gather dirt and water for a hundred miles. The fabric, that ought to be protected by the tread, rots, and you have a blow-out that ruins the tire.

Unless you have a vulcanizer, casing cuts will never get any attention. They don't look important enough to turn over to a garage for repair.

Result—you buy two tires where one would do as well.

SHALER Vulcanizer

If you'll fill the cuts and gashes in your tires with new, live Para rubber, and weld it in with a Shaler Vulcanizer, the tire will be as good as new until the tread is worn through. Why endure the trouble and danger and expense of blow-outs when there's this sure remedy? There is no satisfactory substitute for vulcanizing. No other method makes permanent repairs. All tube injuries are mended with the same vulcanizer.

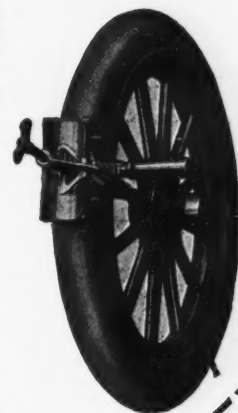
You or your chauffeur can do the work in spare moments. No skill or experience necessary. Full directions and a supply of repair material accompany each machine.

Shaler Vulcanizers operate from your electric lighting circuit or with alcohol lamp. Prices, \$2.00 and up.

C. A. SHALER CO.

233 Fourth Street

WAUPUN, WIS.



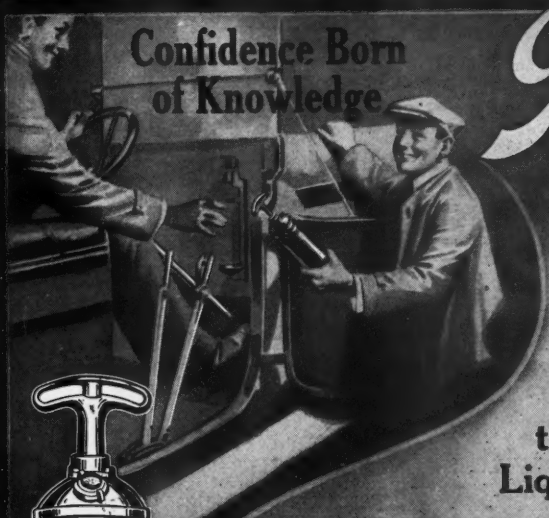

Send This Coupon today and receive a complimentary copy of "Care and Repair of Tires." It gives a remedy for every tire emergency. Write today.

Send me a copy of Care and Repair of Tires Free.

NAME
ADDRESS

C. A. SHALER CO.,
233 Fourth St.,
Waupun, Wis.

**Confidence Born
of Knowledge**

Offices
Atlanta
Baltimore
Boston
Buffalo
Chicago
Dayton
Denver
Louisville
Memphis
Norfolk
Oklahoma City
Pittsburgh
St. Louis
San Antonio
York, Neb.

Pyrene
TRADE MARK
**FIRE
EXTINGUISHER**

**Will instantly smother the most
stubborn gasoline fire.**
A gas blanket which completely
cuts off the air supply and *smothers*
the flame is formed when Pyrene
Liquid comes in contact with heat.

Used by the Standard Oil Companies, railroads, traction and power
companies, and industrial corporations throughout the United States

Write for Booklet
PYRENE MFG. CO., 1358 Broadway, New York

**LACK OF PYRENE PROTECTION
MAY MAKE *YOUR* CAR
"A SKELETON ON THE ROAD"**

Brass and Nickel-plated Pyrene
Fire Extinguishers are the only
one-quart fire extinguishers in-
cluded in the Lists of Approved
Fire Appliances issued by the
National Board of Fire Under-
writers.

Pacific Coast
Distributors
**Gorham
Engineering Co.**
San Francisco
Los Angeles
Seattle



Here's a High Grade Motor
Truck Easy to Buy, Easy to
Operate and Easy to Pay For

You couldn't ask for more than we
offer you in the

Selden One-Ton Truck

every feature of which compares favorably
with trucks selling for double the money.

The price is \$2000 but so confident are we of the absolute dependability of this truck that we let
you put it into service upon payment of only \$500 down and the balance in twelve monthly installments
of \$125 each. This practically allows the Selden to earn its cost during the time you have to pay for it.

THE SELDEN TIME PAYMENT PLAN

has proved popular with hundreds of firms that did not feel that they could spare the full purchase price
from their working capital at one time, and should appeal to you.

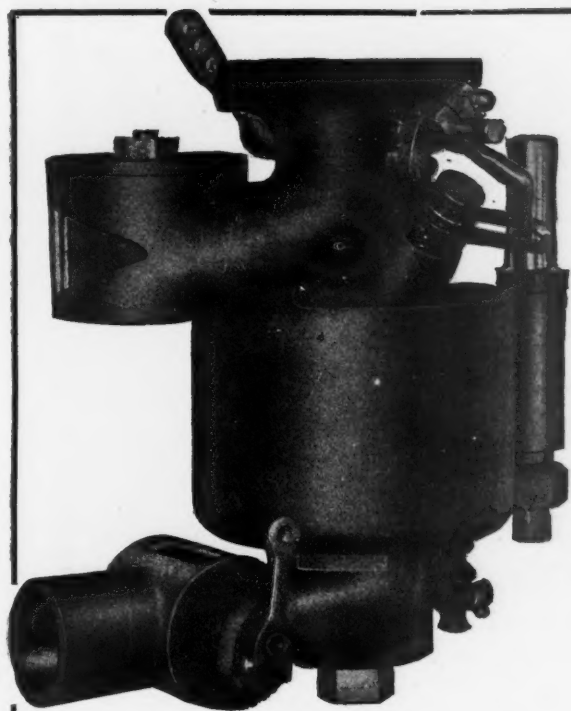
Investigation will prove the Selden is the Truck you want and on terms that you can afford.

Agents wanted in unassigned territory



Selden Truck Sales Company

262 East Avenue *Pioneers in Selling Trucks on Time* Rochester, N. Y.



The Gallagher Carburetor The Master Mind on the Car

Many motorists fail to realize how much better and more efficient the engine would work if it had proper carburetion. The weakest point on the gasoline engine is the carburetor. Without a doubt you've proved it for yourself many times in your motoring experience.

But here's a carburetor that is absolutely troubleless. The GALLAGHER CARBURETOR has no balls, cams, springs or weights. After the first adjustment it need never be touched. **IT'S THE ONLY TROUBLELESS CARBURETOR ON THE MARKET.**

When the motor demands more gasoline you don't have to depend on the word of the manufacturer of an "automatic" carburetor or juggle half a dozen different screws and valves. **You control the GALLAGHER from your seat.**

Constant low speed air with the low speed fuel supply is practically a carburetor by itself; the high speed fuel supply, together with the high speed air, is only in use when required. The result, therefore, is greater efficiency and unfailing economy. The GALLAGHER CARBURETOR has less parts than any other; stands greater service—gives more power—and **once adjusted is always adjusted.**

You can't buy a carburetor that will do more than—or even as much as—the GALLAGHER—and that is the reason why **your motor** should be equipped with it.

"It's different"

Write for our catalog today

GALLAGHER CARBURETOR CO., Inc.

1876 BROADWAY

NEW YORK CITY

You put away your tools while your tire is being pumped with a **MAYO ^{SPARK} PLUG PUMP**

All you do is repair the puncture. Your motor inflates your tire for you. You make a quick get-away—have got your tools put away while the other fellow is still sweating over his hand pump.

A Mayo will fill your tires five times faster than a hand pump. It will inflate the largest tire in from one to four minutes. It pumps nothing but pure, fresh air. Instantly attached by substituting for any spark plug.



Try One FREE
On Your Car for 30 Days

Price \$10.00
With Pressure Gauge
\$2 Extra

**Mayo Mfg.
Company**
55 East 18th St.,
Chicago, Illinois

When Writing to Advertisers, Please Mention Motor Age.

Announcement to Dealers

We announce the transfer of our Sales Department from Nashville, Tenn., to the Herff-Brooks Corporation of Indianapolis, Ind.

By this change in sales method we bring the dealer as well as the buying public in closer touch with our organization, and we have overcome a large selling expense, thereby enabling our sales agents to offer both dealer and the consumer a car which has never been surpassed both as to size, power, workmanship, material, equipment, appearance and price.

The same business policy which for years past has stamped approval on our methods will be continued by the Herff-Brooks Corporation.

Inasmuch as our selling agency is now assigning territory for the 1914 season, we know it would be profitable for all dealers to investigate the Marathon and their dealer's proposition.

We know that with the public's knowledge as to the conservative judgment which has existed in this company for years past, and which has been the cause of our success, that they will take as a foreword from us, "The Marathon is a 'whirlwind' for 1914."

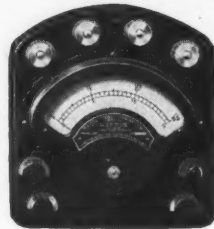
All dealers' inquiries concerning 1914 Marathon Cars should be addressed to Herff-Brooks Corporation, Indianapolis, Ind.

Announcement next week.

Marathon Motor Works
Nashville, Tenn.

Every Automobile and Garage Owner or Operator

should possess a reliable, durable, convenient Electrical Measuring Instrument



WESTON MODEL 280
Portable Testing Instrument

Weston Miniature Precision Ammeters and Voltmeters

FIT THE POCKET

and are in every way the most accurate, durable, reliable and altogether satisfactory for testing batteries and electrical circuits.

Send for 30-page bulletin No. 8 describing these and other small instruments.

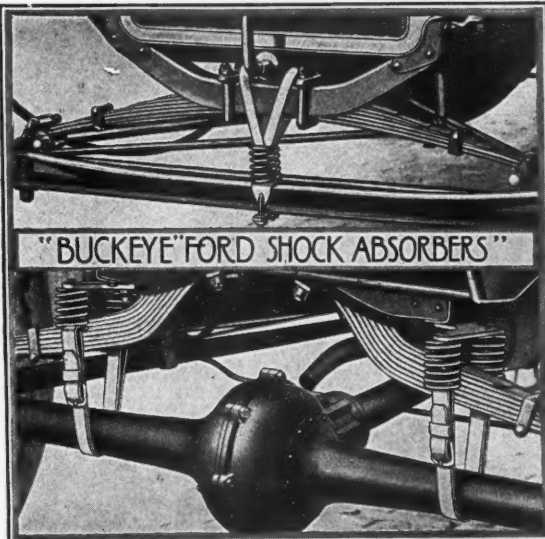
Weston Electrical Instrument Co.

NEWARK, N. J.

| | | | | |
|--------------|---------------|-----------|------------|----------|
| New York | Boston | Denver | Birmingham | Montreal |
| Philadelphia | San Francisco | Cleveland | Toronto | Paris |
| Chicago | St. Louis | Detroit | London | Berlin |

"Ford" Shock Absorbers

FIVE
DOLLARS
THE
SET



1
FOR
FRONT
2
FOR
REAR

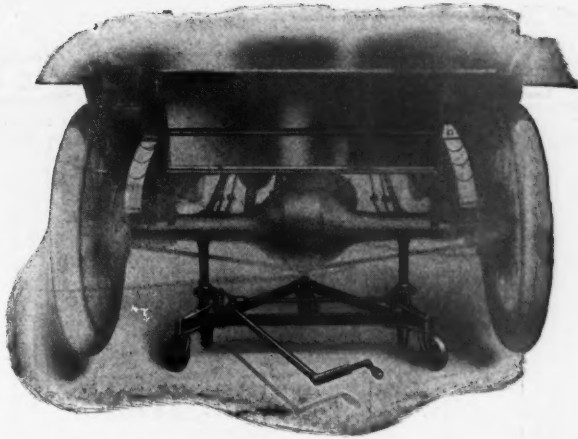
Made for "Ford" cars only—fitting any model
Our "Buckeye" Ford Shock Absorbers guarantee Easy Riding on the Roughest of Roads.

Absolutely prevent broken springs, the absorbers taking the shock when springs rise above their neutral position. Front absorber also prevents excessive compression of front spring. Full oil tempered springs of best quality—attached in a few minutes' time—no holes to drill—simply clamp to frame.

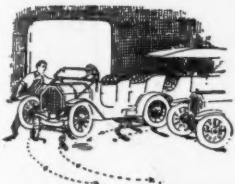
\$5.00 per Set of Three (Shipping weight, 7 pounds)

At all jobbers and dealers, or sent direct on receipt of price.

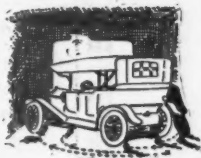
Manufactured by
THE CENTRAL BRASS & FIXTURE CO., Springfield, Ohio
CANADIAN DISTRIBUTORS
JOHN MILLEN & SON, Montreal, Toronto, Winnipeg, Vancouver



Public—or—Private



Garages
all
Need



WEAVER Auto Twin-Jacks

THEY save money wherever Autos are to be handled. They are the only means by which one man can handle a heavy car in the garage with perfect ease and safety.

They Will Save Money

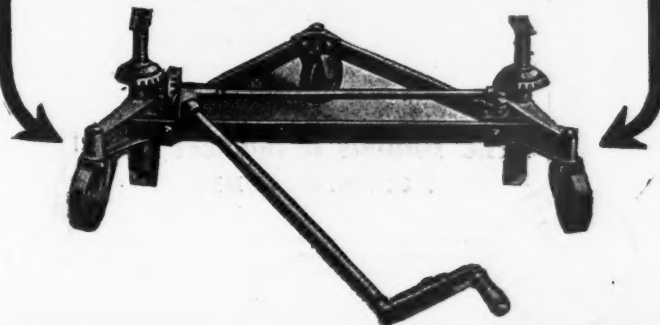
YOU ——— and ——— YOU

| | |
|------------------------------|--|
| Mr. Public Garage Man | Mr. Private Garage Man |
| In Unloading Cars. | In Saving in Tires. |
| In Saving in Floor-space. | In Service as Turntable. |
| In Washing Cars. | In Testing Brakes. |
| In Overhauling Cars. | In Washing Cars. |
| In the Paint Shop. | In Shifting one car where two are housed in same garage. |
| In Time and Labor. | In Overhauling your car. |

There is no contingency in handling cars which these jacks will not meet to the best advantage.

Two for \$20 One for each axle
LIBERAL DISCOUNTS TO DEALERS

Weaver Manufacturing Company
2165-9 South 9th St., Springfield, Ill.



Put This in Your Auto-coat Pocket

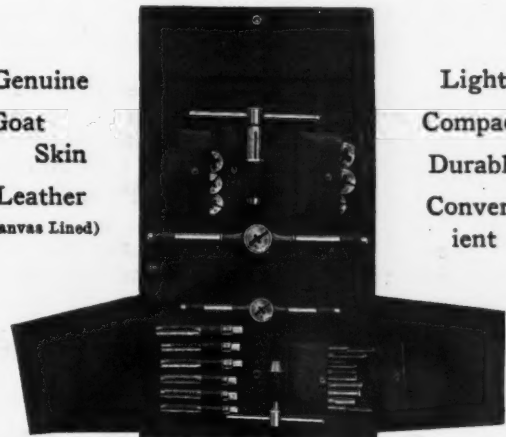


Then when the
Emergency Arises

open it out like this

Genuine
Goat
Skin
Leather
(Canvas Lined)

Light
Compact
Durable
Convenient



Has 16 Taps, 16 Dies, 2 Stocks and
2 Tap Wrenches.

Cut a Screw Thread and Ride Home on your own gasoline

This is not a cheap bargain counter eye catcher. The Taps, Dies, Stocks and Tap Wrenches are of the same high standard that has kept Wiley & Russell Mfg. Co. in the front rank for over 40 years as makers of first quality screw cutting tools.

MANUFACTURED BY

WILEY & RUSSELL MFG. CO.
GREENFIELD, MASS.

New York
90 Center St.

Philadelphia
38 N. Sixth St.

Chicago
545 W. Washington Blvd.

SEE ONE AT YOUR DEALER'S



Type A S

*For Starting, Lighting
and Ignition*

These Are The Right Batteries For Your Gasoline Car

The plates of these Gould Batteries resist wear, retain their capacity, resist dislodging of the active material through overcharge, withstand hard service conditions and eliminate damage from jarring and vibration to an extent not found in batteries of any other make. This, because only a THIN LAYER of the plate surface, instead of the entire mass is softened in producing the necessary capacity.

The group of cells, in hard rubber jar, is enclosed in a strong hardwood box and the design of the terminals, hard and soft rubber elements and pitch seal are such that LEAKAGE OF ACID AND CORROSION OF THE TERMINALS ARE PREVENTED ABSOLUTELY.

The terminals are out where they are of easy access, and the heavy connections are applied in a way that assures constantly perfect electrical contact.

**DO YOURSELF AND US THE JUSTICE
OF MAKING A TRIAL INSTALLATION.**

Ask for our literature.



Type A L

For Lighting and Ignition

Gould Storage Battery Co.

GENERAL OFFICES: 30 EAST 42nd ST., NEW YORK

Boston: 89 State Street. Philadelphia: 613 Betz Bldg. Chicago: The Rookery. Detroit: 999 Woodward Ave. Cleveland: American Trust Building. San Francisco: 904 Rialto Building.

WORKS: Depew, New York

Agents in: Washington, Kansas City, Denver, Topeka, Los Angeles, Seattle: Canadian Representative, R. E. T. Pringle, Toronto, Montreal, Winnipeg, Vancouver.

Full stock of parts, plates, and repairs carried by all Offices and agents



Billings & Spencer

Special Drop Forgings FOR The Automobile Trade

We make a specialty of special drop forgings.

The fact that we are the pioneer manufacturers speaks our thorough experience.



All drop forgings are annealed and pickled, if desired.

We guarantee workmanship and material and replace without charge all defective forgings.

Send us model, blue print or drawings. Estimates immediately furnished.

**The Billings & Spencer Co.
Hartford, Conn.**





**The McAlpin answers the
question of where to live
in New York**

NO hotel is so well equipped to serve the needs of the traveller as the McAlpin—it is the world's largest and safest hotel—famous for the luxurious, home-like accommodations extended its guests—its exceptional restaurants and unexcelled cuisine—its perfect service—its complete appointments—and its notable moderation in prices.

Hotel McAlpin guests enjoy the most desirable location in the city—Broadway and 34th Street—in the midst of the shops and on the threshold of the amusement district. Just one block from the Pennsylvania Terminal—a few minutes jaunt to the Grand Central Station.

When you are in New York, you should live at the McAlpin.

Management of MERRY & BOOMER

HOTEL McALPIN

Herald Square

NEW YORK

Nearer than Anything to Everything



DID you ever happen to think that it's the duty of the motoring host to know the right route—to see that his guests aren't inconvenienced by frequent stops to inquire the way, by retracing tedious miles along the wrong road?



**THE AUTOMOBILE
BLUE BOOK**

pays its fare (\$2.50 a volume) the first day out—in up-keep, comfort, and patience. The Blue Book tells you the road in the simplest way imaginable—your odometer is your compass.

Make it a part of your touring kit.

Bound in royal blue flexible leather

On sale at leading automobile supply houses, good book stores, many hotel newsstands, and at all Blue Book Touring Bureaus. Or sent prepaid upon receipt of price,

—\$2.50 per volume—

- Volume 1 New York and Canada
- Volume 2 New England and Maritime Provinces
- Volume 3 New Jersey, Pennsylvania and the Southeast
- Volume 4 The Middle Western States
- Volume 5 Mississippi River to the Pacific Coast

**THE
Automobile Blue Book Publishing
Company**

910 So. Michigan Ave.
Chicago, Ill.

2162 Broadway
New York

NOTICE

We respectfully call attention to the fact that the Knox Automobile Company is the only other manufacturer licensed to build tractors under the "Martin" patents and other patents owned by Mr. C. H. Martin. These patents, we believe, cover every possible, practical combination of a self-supporting and steerable tractor, with a non-self-supporting trailer. These patents comprise:—

| | | |
|------------|-----------|---------------|
| Hunter ... | 670,405 | Mar. 19, 1901 |
| Hunter ... | 696,143 | Mar. 25, 1902 |
| Hunter ... | 625,953 | May 30, 1899 |
| Thayer ... | 678,063 | July 9, 1901 |
| Martin ... | 1,018,248 | Feb. 20, 1912 |
| Hight ... | 698,836 | Apr. 29, 1902 |
| Liebau ... | 655,724 | Aug. 14, 1900 |

and numerous applications are now pending in the United States Patent Office.

This notice is merely in the nature of general information.

Martin Tractor Company
Springfield, Mass.

Veeder

"Near Enough"—

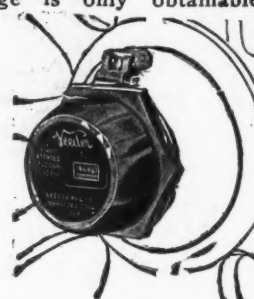
won't do, if you want to know the *exact cost* of upkeep of pleasure or commercial vehicle. Mileage must be correct to a fraction if you are interested in tire, gasoline or "juice" and lubricating consumption. Exact mileage is only obtainable with a VEEDER HUB ODOMETER—which *can't be tampered with.*

Neat, durable and compact. It can be easily attached. Price complete, **\$25.00**

At your dealer's direct from our factory or at the following agencies:

T. H. Cranston & Co., 56 E. Randolph Street, Chicago, Ill.

Bernard I. Bill, 543 Golden Gate Avenue, San Francisco, Cal.



The Veeder Manufacturing Company

C. H. VEEDER, President D. J. POST, Treasurer
H. W. LESTER, Secretary
HARTFORD, CONN.

Makers of Cyclometers, Odometers, Tachometers, Tachometers, Counters and Small Die Castings

Light up with a

"Presto" Star Watch Type Cigar Lighter

PURE PLATINUM TIP—GUARANTEES PERMANENCY

When you want to smoke simply press the stem, and "Presto!" you have a light, going at any speed. No stooping to light up. Absolutely safe, all metal parts thoroughly insulated. Does away with matches and all danger from fire. Gets its power direct from the battery. Fitted with platinum lighter tip made for 6, 8 and 12 volt batteries. Looks like a watch. An ornament to any car. Case is of polished wood, ebony finish. All metal parts heavily nickel plated. Complete with 10 ft. silk cord, and holder which can be placed in any part of car. Price, each,

\$2.50



"PRESTO" Star Cigar Lighter, complete with Holder, \$2.50

The same design of a cigar lighter, watch shape, is also made for Ford cars. When ordering, specify Presto Ford. Price\$2.50

Jobbers and Dealers—Get Busy!!

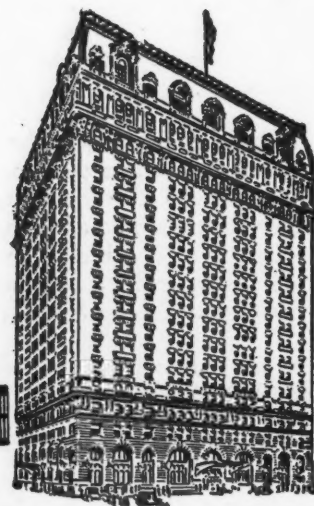
"Presto" 3 in 1 { Cigar Lighter Repair Lamp Lamp Lighter

Just press the button and light your cigar going at any speed, or you can use it to light your acetylene lamps in the strongest wind. No more striking matches. Also a handy exploring lamp with nickel plated reflector. Always at your elbow, within easy reach. Is 6-volt electric. Complete **\$3.50** with 10 ft. silk cord. Price, each.....
Highly polished holder for dash attachment, 25c extra
At all dealers, or sent prepaid on receipt of price



METAL SPECIALTIES MFG. CO.
736-738 W. Monroe St. Chicago, Ill.

"PRESTO" 3 in 1
Price \$3.50



Hotel La Salle

CHICAGO'S FINEST HOTEL

ERNEST J. STEVENS, Vice-Pres. and Mgr.

Located in the heart of the city, within easy reach of all railway terminals

RATES

| | |
|-------------|--|
| ONE PERSON | Room with detached bath.....\$2 to \$3 per day |
| | Room with private bath.....\$3 to \$5 per day |
| TWO PERSONS | Room with detached bath.....\$3 to \$5 per day |
| | Room with private bath.....\$5 to \$8 per day |

TWO CONNECTING ROOMS WITH BATH

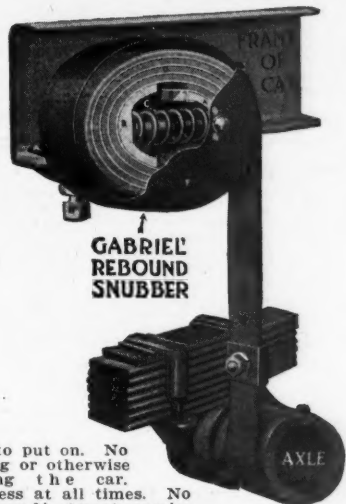
| | |
|--------------------|---------------------|
| Two persons | \$5 to \$8 per day |
| Four persons | \$8 to \$15 per day |

SUITES\$10 to \$35 per day

LA SALLE AT MADISON STREET, CHICAGO

GABRIEL

Rebound Snubbers



Easy to put on. No drilling or otherwise marring the car. Noiseless at all times. No further adjustment required and will outlast the car.

We apologize—

because we used to make Shock Absorbers—but that was several years ago, before the advent of modern high-set flexible springs put them out of date.

Since then—

we have made amends by bringing out the **one** device adapted to modern springs, Gabriel Rebound Snubbers.

As a result—

thousands of motorists are enjoying the utmost easy-riding on **rough** roads without loss of spring resiliency on **smoother** roads. Their Snubbers never rattle, work loose or break; nor do they require any re-adjusting.

In fact, these fortunate motorists have forgotten the Snubbers on their cars just as they have forgotten the jolts, jars and big repair bills they had before they used Snubbers.

Used by practically all the leading car builders; Standard Equipment on the easiest riding cars;

Peerless Stearns White

Why don't you get more comfort and longer mileage from **your** car? Full information on request.

Gabriel Horn Mfg. Co., -1415 East 40th Street—**CLEVELAND, OHIO**

Makers of the famous GABRIEL Musical Horns and auto accessories

Which will it be this season—Mr. Motorist—EAGLEINE NO-KARBON OIL, and a powerful, silent, clean motor—or “any old” oil, and a Big Repair Bill?

Poor lubrication is the cause of more engine trouble and consequent expense than any other single factor. Carbon deposits mean lessened horsepower and decreased pleasure.

Not only does EAGLEINE NO-KARBON OIL do away with carbon deposits, but it maintains a protective lubricating body in all temperatures and under all conditions. Actual

chemical tests in comparison with other oils have proved it to contain **less** carbon and other impurities than any other oil on the market.

The better the car you drive, the greater the need for EAGLEINE NO-KARBON OIL.

See that **you** get it.

EAGLE OIL & SUPPLY COMPANY

Chicago Branch: 1114 W. 37th Street
CHICAGO, ILL.

104 Broad Street, BOSTON, MASS.

Roger W. Stadlman, 21 Hoover Street
LOS ANGELES, CAL.



FREE TO DEALERS

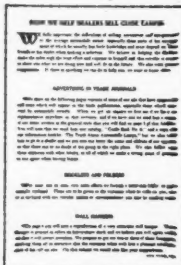
This Beautiful Spooners' Hanger

Size 11½x15½ printed in colors. Sent free to any dealer who writes on his own stationery. Five dollars for the best title for this picture. Send in your suggestions. Winner will be announced in Guide ads.

Our Dealers' Proposition is waiting for you. Tells how to sell more lamps and pile up profits. Write today for hanger and dealers' proposition.

The Guide Motor Lamp Mfg. Co.
East 4th St., 34 Cleveland, Ohio

Guide
MOTOR LAMPS.



Let STEAM Do Mending In 20 Minutes!



At last! A handy vulcanizer that **DOES** vulcanize—that does **NOT** burn the tire! Shrinks tire up—keep cost to almost nothing!

There, crammed into a few words, are the astonishing advantages offered motorists by the Positive Steam Tire Vulcanizer. A vastly improved money-saving device that utilizes steam—the only scientific vulcanizing agent, and at instant notice gives you factory service at home.

Positive Steam Tire Vulcanizer

In Single Season Saves Owner Ten Times Cost

All you do is apply raw gum rubber, clap on the steam vulcanizer, put water in one section, gasoline in the other, and touch a match. In 20 minutes time the job is done. Done so well, mind you, that the union of raw rubber and casing is as solid as the casing itself. Done without risk of ruining your tire by burning it, (one of the dangers of the common fire-heated vulcanizers)—AND—done at a SAVING that in one season pays ten times over for the Steam Vulcanizer.

Get More Mileage Out of Junked Tires

That's what you can do. You can mend holes either in tube or casing up to 2½ inches in diameter with one setting. Reset for larger holes.

Dealers! Here's a live proposition! Get in touch with us at once if you want to handle a sure money-maker!

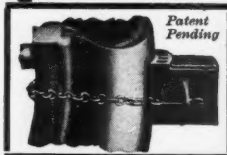
Tires scrapped, can thus be brought to life for hundreds of miles of added service. Price complete \$5.00.

Drop a Card Today

You can't afford to pay big prices for those inevitable tire repairs. Here's ready relief! Utilize it! Send card today for complete information.

THE POSITIVE TIRE VULCANIZER CO.

404 Rock Island St. Davenport, Iowa



(8)

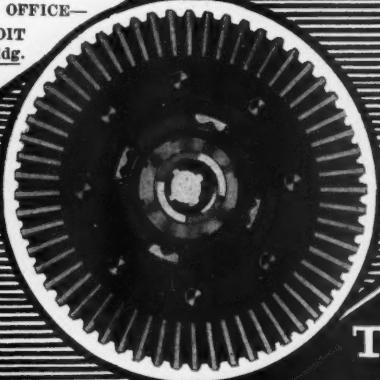
TRANSMISSIONS—STEERING GEARS

CLUTCHES

DIFFERENTIALS

—BRANCH OFFICE—

DETROIT
628 Ford Bldg.



THE
ORIGINAL
WARNER GEAR CO
MUNCIE—INDIANA

U-S-L



U-S-L

Takes the place of the Fly-wheel

The U-S-L Electric Starter and Lighter is a combination motor and generator that takes the place of the fly-wheel. The armature of the motor-generator is bolted directly to the engine crank-shaft.

The U-S-L doesn't add a single extra moving part to a car.

No gears or chains
No added weight
No bearings to oil

No extra clutches
Starts at a push of foot-button
Supplies ample current

Adopted by

Rambler, Overland, Garford,
Edwards-Knight, Moyer, S. G. V.

Write for Bulletin 501

The U. S. Light & Heating Co.

General Offices: 30 Church St., New York

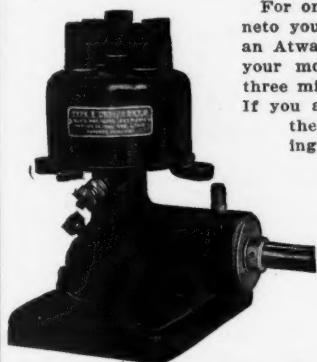
Branch Offices and Service Stations—New York, Boston, Buffalo, Cleveland, Detroit, Chicago, St. Louis, San Francisco.

Have You An Unsatisfactory Magneto?

Even if your motor has no timer shaft you can nevertheless install

The Atwater Kent Ignition System

by means of our "Magneto Gear Mounting." It fits the standard magneto platform and connects to the magneto drive shaft. The gears it contains are enclosed, smooth running and quiet in operation.



For one-half the price of a new magneto you can replace your old one with an Atwater Kent System which will run your motor as smoothly "on high" at three miles an hour as at thirty or fifty. If you are also interested in increasing the speed, flexibility and hill-climbing ability of your car, you will want a copy of our latest literature describing the Atwater Kent System.

WRITE
FOR
FOLDER "A"

ATWATER KENT MFG. WORKS

4934 Stenton Ave.
PHILADELPHIA

INSIST UPON THE RED TAG



ACCEPT NO SUBSTITUTE
FOR
PLATINUM POINTED
Mosler
Spit Fire
Plugs

A. R. MOSLER & CO.
P. O. Box "M," MT. VERNON, N. Y.

510

EMPIRE

Porcelains—

You can crack them with
a hammer

No motor cylinder has ever become hot enough to crack one of them, however. And it's in the cylinder that a spark plug COUNTS—not under a hammer.

Spark plug manufacturers who want a porcelain that is as tough and rugged as human hands can make it, will specify "EMPIRE."

Manufactured by expert workmen, of specially selected kaolin imported from Cornwall. Fired at a temperature of 2,600° F.—many times greater than any heat met with in actual service. Subjected to brutal efficiency tests for breakage and long life.

Write for Sample and Catalogue

Empire China Works
142-156 Greene St., Brooklyn, N.Y.



Starts — Lights — Ignites

REMY

Six Volt System—Does-It-All

THERE is only one real way to provide for the efficient starting, lighting and ignition of your car.

Have one manufacturer design and build all three systems; have this one manufacturer responsible for all three.

We are the only concern building the complete apparatus—either as a whole or in any combination—starting—lighting equipment—magneto, or battery ignition (generator and storage battery). The starting and lighting equipment is sold only to automobile manufacturers.

Write for our magneto exchange offer.

Remy Electric Company

General Offices and Works, Anderson, Indiana

BRANCHES:

New York Detroit Kansas City Minneapolis
Boston Chicago San Francisco

(Service stations throughout the country)

The Hollenden

European Plan

800 Rooms

**Rate with Bath
\$2.00 to \$5.00**

Automobile Headquarters

Cleveland, Ohio

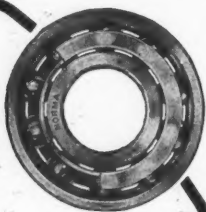
Norma Ball Bearings

Have been adopted as standard by many of the leading makers of ignition, lighting and starting generators, and magnetos—because they have been found to possess in highest degree the faculties for silent running and long life under high speed operation.

THE NORMA COMPANY
OF AMERICA

20-22-26 Vesey St.,

New York



You need these four valuable books. They describe reliable ignition apparatus. Send to our nearest house.

WESTERN ELECTRIC COMPANY

1914 *Marion* 1914

SEND to us today for advance folders which tell all about the big, new six-cylinder MARION. See the advertisements in all trade papers; wire us about our unusual dealers' contract for 1914.

THE MARION MOTOR CAR CO.
902 Oliver Avenue, INDIANAPOLIS

INTERLOCKS Double Your Mileage

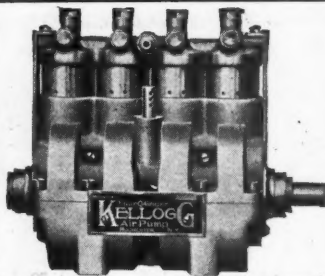
INTERLOCKS make new tires wear twice as long, or give you an extra season's wear out of old tires.

More than that, **Interlocks** give you confidence that you will not have blow-outs, rim cuts or punctures to spoil your motoring pleasures.

Interlocks are complete inner tires—not inner shoes—placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They insure safety—make new tires give twice the usual mileage, and add 1000 to 5000 miles to old ones. Don't affect resiliency.

Car owners and dealers—write for our booklet giving facts about road tests, prices, testimonials, and our 1913 proposition.

DOUBLE FABRIC TIRE CO., 128 W. 9th St., Auburn, Ind.



Nothing can replace air for tires, and there's nothing to supply air to tires that equals the efficiency of the

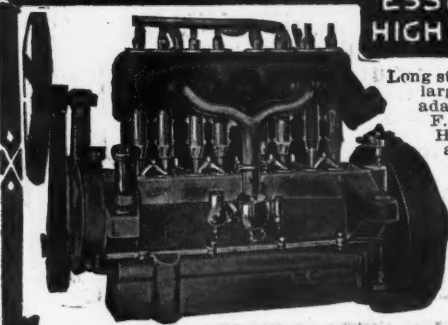
**Four Cylinder
KELLOGG
Air Pump**

Ask any care-free motorist why he experiences so little tire trouble and he'll tell you it's because the Kellogg always inflates his tires to the desired pressure in the shortest length of time with the least trouble on his part. Ask your dealer or write

Kellogg Mfg. Co., 83 Circle St., Rochester, N. Y.

The BRENNAN MOTOR

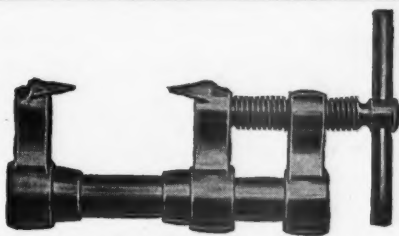
**ESSENTIAL TO
HIGH CLASS CARS**



Long stroke, large bearings, large valves, 4½x5, adapted for Regal, E. M. F., Warren, Autocar, Hudson and all standard makes of cars and trucks. We also furnish transmission gears. Two and four cylinder sizes, from 20 to 60 H.P.

Send for Catalogue "B"
**BRENNAN
MOTOR MFG. CO.**
Syracuse, N. Y.

**"STOPS
Spring
Squeaks"**



Spring Leaf Lubricator

Why do the Cadillac Motor Car Company, of Detroit, include it in their 1913 equipment?

Can we produce any better evidence as to its usefulness?

All right! It makes your car ride easier; it prevents your springs from rusting and squeaking—thus eliminating breaking; and, answers as a Repair Clamp, if you break a spring.

Try your DEALER, if he doesn't handle it, send \$1.50 (check or money order) and we will send one prepaid to any part of the United States or Canada.

Money refunded, if not satisfied

SPRING LEAF LUBRICATOR CO.

1004 Forest Avenue

ANN ARBOR, MICH.



**"There's a mighty
big difference
in lubricators!"**

Don't blame your car for what it can't help. Many a car is inefficient only because its lubrication is bad. Try Badger Gear Compound just once and notice the difference.



BADGER Gear Compound

Is "Always on the Teeth"

It never runs thin and stays where you put it. Will not pack the sides of the gear case. Nothing like it for minimizing wear and quieting rear axles and transmissions. Every ounce lubricates. Learn more about this power-saving lubricant—also about the popular F. V. Motor Oil and Badger Lubricants. Ask your dealer or write us.



Dealers, Write Us

WADHAMS OIL COMPANY

Milwaukee, Wis.

Cross Rolled (United) Spring Steel

Possesses endurance, strength and resiliency not equalled by any other steel.

It eliminates the dangers and possibilities of flaws—irregularities—hidden weaknesses, etc.

Why not use such steel when it costs no more than the ordinary kind—especially when it can be depended upon as being free from surface defects.

Furnished in Chrome Vanadium, Chrome Carbon or Special Analysis Open Hearth Steels.

Write for prices and details

The United Steel Co.

Canton, Ohio

New York

Chicago

Detroit



Why the Reacto?

Because—

The REACTO is equally suited for city or country driving.

The REACTO gives a clear, deep, penetrating tone, yet not so abrupt as to call for an apology.

The REACTO is dependable in every sense—well built—strong in every part—will last as long as the car.

Specify the REACTO—the best in horns.

SEND FOR BULLETIN NO. 158M

The Holtzer Cabot Electric Co.
Chicago, Ill. Brookline, Mass.

When Writing to Advertisers, Please Mention Motor Age.

PATHFINDER


WORTHY OF THE NAME

THE PATHFINDER car is an unusual combination of mechanical virtues. Each detail is standard in design, workmanship, and quality materials.

The Pathfinder chassis is a composite of the best proven ideas in European and American practice—built to withstand rough usage and to remain quiet even in "old age." The Pathfinder "selling plan" is one you will be glad to know about. It is unique and comes to you in the form of the "101 Reasons," a short, concise course in Pathfinder salesmanship. Yes, it is absolutely different—better write today, NOW!

Just ask for—
"Photo Story of a Pathfinder"
"100 and 1 Reasons"

THE MOTOR CAR MFG. CO.
Indianapolis, U. S. A.



THE COAST LINE TO MACKINAC

THE CHARM OF OUR SUMMER SEAS

Spend your vacation on the Great Lakes

The most economical and enjoyable outing in America

WHERE YOU CAN GO—Daily service is operated between Detroit and Cleveland, Detroit and Buffalo; four trips weekly between Toledo, Detroit, Mackinac Island and way ports. 10 day stopover allowed at Alpena either direction on tourist tickets without additional cost. Daily service between Toledo, Cleveland and Put-In-Bay. During July and August, two boats out of Cleveland and Detroit, every Saturday and Sunday night.

A Cleveland to Mackinac special steamer will be operated two trips weekly from June 15th to September 10th, stopping only at Detroit every trip and Goderich, Ont., every Monday up-bound and Saturday down-bound. Railroad Tickets Available on Steamers. Special Day Trips Between Detroit and Cleveland, During July and August.


Send 2 cent stamp for illustrated pamphlet and Great Lakes Map

Address: E. G. Lewis, G. F. A., Detroit, Mich.

Philip H. McMillan, Pres.
A. A. Schantz, Vice-Pres. and Gen'l Mgr.

DETROIT & CLEVELAND NAVIGATION CO.

**DETROIT
CLEVELAND
BUFFALO
NIAGARA
FALLS
TOLEDO
PORT HURON
GODERICH
ALPENA
ST. IGNACE**



GOOD YEAR

AKRON, OHIO

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense.

(673)

THE GOODYEAR TIRE & RUBBER CO.
AKRON, OHIO

WINTON SIX

You'll Love It

A car of wonderful beauty and goodness. "Class" is written all over it and woven into it. It's the fashion plate of Motor Cars—you'll love it. Send for catalog.

THE WINTON MOTOR CAR COMPANY
424 Berea Road, Cleveland, O.

World's First Maker of Sixes Exclusively

CONNECTICUT

Master Vibrator For Ford Cars



A dependable master vibrator at a reasonable price. Makes starting easy—motor-ing becomes a pleasure.

Flush Type—Price \$9.00
Delivered upon receipt of price
Send for Bulletin No. 28

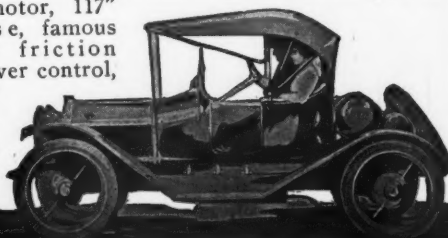
Connecticut Tel. and Electric Company, Inc., Meriden, Conn.

The LAMBERT

The LAMBERT Model 99 (5-passenger touring car or 2-passenger roadster) at \$1365 (fully equipped) stands at the head of its price class. It comprises 4 1/4 x 5 1/4

Rutenber motor, 117" wheelbase, famous LAMBERT friction drive, one lever control, etc. Write for catalog.

BUCKEYE MFG. CO.
ANDERSON, IND.



MODEL 99 2 PASS. ROADSTER

Diamond SAFETY TREAD

(Squegee) TIRES

Won't Slip - Won't Slide
Won't Skid - They Grip!

THE DIAMOND RUBBER CO. OF N. Y.
Subsidiary of The B. F. Goodrich Co.
Akron, Ohio

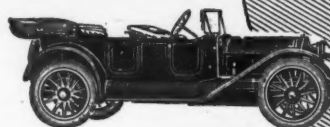


The 6-Cylinder, Reasonably Priced

de Soto Six 55 H.P.

The car with a stronger appeal than any recent product of the trade—the one that meets a popular demand. We have an unusually attractive proposition for dealers. Write at once for free catalog and full particulars.

**Sells for
\$2,185**



de Soto Motor Car Company, Auburn, Ind.

MOTOR DRIVEN SAMSON HORNS 6 STYLES



NO. 11—SAMSON
12 3/4" Overall

Loud
Simple
Strong
Reliable
Guaranteed

Live Dealers,
get our mon-
ey making
offer quick.

AMERICAN ELECTRIC COMPANY

State and 64th Sts.

Manufacturer

Chicago, U. S. A.



The BENTON

The Spark Plug that is water-proof,
gas-proof, soot-proof, fool-proof and
proof against competition.

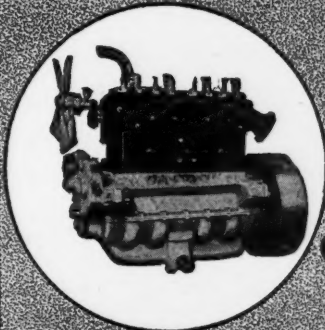
THE ONLY GENUINE
CASE-HARDENED SPARK PLUG

All standard sizes...\$1.00

ASK YOUR DEALER OR WRITE

L. F. BENTON CO., Dept. A, Vergennes, Vt.

Continental Motors



A WORLD-
STANDARD
FOR QUALITY
AND SERVICE

Continental Motor
Mfg Co
DETROIT MICH

Everything In Sheet Metal for the Automobile

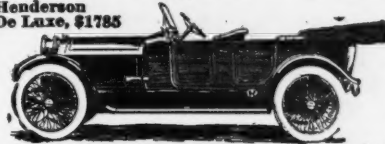
We manufacture only one unit of the automobile—the sheet metal parts. They are twenty in number—but the same nature underlies them all. Hayes sheet metal parts are built into nearly every automobile made. We're the largest users of sheet metal in the world. We do only one thing—and do it well. That's the reason.

Hayes Manufacturing Co.

DETROIT, U. S. A.

How Largest Profits are Made

Henderson
De Luxe, \$1785



We have some inter-
esting facts in connec-
tion with increasing
your car sales and
profits.

Selling some cars, you
may sell large numbers
—and still your yearly
business shows a loss.

Through merchandizing strategy we have remedied these flaws. May we tell you about these things and about our kerosene-burning car, equipped with wire wheels, cowl dash, cowl gasoline tank. Left drive, center seat control—the most salable car offered today.

Wire or write for the facts

Henderson Motor Car Co.

Indianapolis, Indiana

HENDERSON

THE ONE-MAN TOP

GOLDE PATENT TOP

CAN BE HANDLED BY ONE PERSON AS EASILY & QUICKLY AS AN UMBRELLA
INSTANTANEOUS PROTECTION
GOLDE-PATENT MANUFACTURING CO. 513 W. 56th ST. NEW YORK.

48 SIX KISSELKAR 60 SIX

The new KisselKar 48 "Six" at \$2350, with the big 60 "Six" at \$3150, give The KisselKar real leadership in the "Six" field. Strikingly handsome cars of unusual comfort. Extra liberal wheelbase—roomy tonneaus—powerful, flexible motor—big wheels and tires. Fully equipped—electric lighted and started—left hand drive, center control. The KisselKar 40 "Four" at \$1850 is the leading value in its class.

Write for Catalog

Kissel Motor Car Co.
121 Kissel Ave.
HARTFORD, WIS.



SEND FOR THIS BOOK-TO DAY

It will show and tell you more about recent developments in motor car accessories than you think can be compressed within the pages of a catalogue.

This is a handy thing for any dealer to have on his desk. It is a real book of reference.

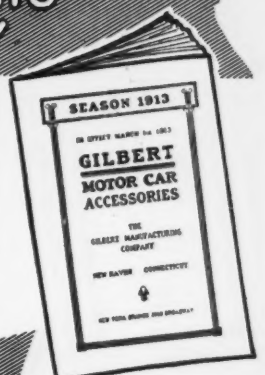
This book is yours—FREE—if you will send us your name and address.

We make special designs for all the latest equipments.

WRITE US.

GILBERT MFG. COMPANY
NEW HAVEN CONN.

New York Branch, 2010 B'way, cor. 68th St.



"HI-LO" MAGNETO HORN For FORD Cars

OPERATES FROM MAGNETO—NO BATTERIES NEEDED



Why "HI-LO" is horn perfection.
No vibrator contacts to adjust.
No pivots or bearings to wear.
No rubber bulb to rot.
No oiling required.
No sticking of reed.
No clogging of whistle.
No trouble to instantly operate.

JUST NO HORN TROUBLE
Anyone Can Attach It in 15 Minutes

GUARANTEED

to not interfere with ignition

All "live" Jobbers and Dealers are selling the "HI-LO" because it is the most "live" Ford accessory on the market.

SEND YOUR ORDER TO

Horn Dept. **PREMIER ELECTRIC CO.**
4036 Ravenswood Pk. Chicago, Ill.

"Hi-Lo" No. 2, \$6.00
Nickel or polished
brass trimmed
"Hi-Lo" No. 1, \$4.00
Plain black enamel
Prepaid anywhere in
United States

TIMKEN AXLES & BEARINGS

"The 'Timken' has won wherever cars run"



NEWTONE MOTOR HORNS

Are not only expected to, but do, give perfect satisfaction and the many thousands now in use demonstrate the fact that they do give perfect service.



Torpedo Type

**Torpedo Type
Price \$20**

**Automobile Supply
Mfg. Co.**

220 Taaffe Place, Brooklyn, N. Y.

United States Tires
are good tires

They cut down tire bills

Gyroscope Principle

**The New Jones Speedometer
Unaffected by Heat or Cold**

You want absolute accuracy in speed readings just as you want the right time from your watch. There is one way to get it—get a New Jones.

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, tests and experiments that show Jones supremacy beyond question. Then specify what speedometer you want on your car this spring.

The Jones Speedometer — Broadway at 76th Street
NEW YORK

Get acquainted with the
standardized "Cole"

the car that is writing gasoline history.
Learn what the

**Cole franchise for
dealers**



will mean to you if you happen to be
located in open territory.

Cole Motor Car Co. of Indianapolis

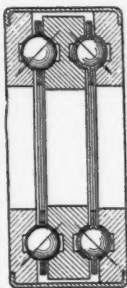
"SIX-48"
\$3250
Fully
Equipped

Riverside Touring Car

Write
for
Booklet

Keeton Motors Ltd.
Brantford Ont.
Canada

Keeton Motor Co.
Lawton & M.C.R.R.
PHONE WAL 1067 Detroit U.S.A.



SUSPENSION BALL BEARINGS

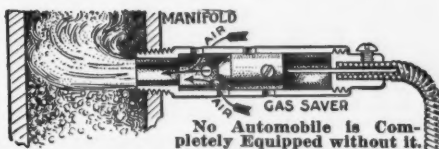
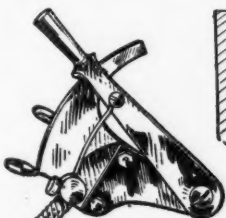
The arrows on the cross section show how the load is evenly carried by upper as well as lower balls, making the only perfectly balanced radial bearing, and at the same time an ideal thrust bearing. This Double Row Ball Bearing will carry a greater load than any other ball bearing.

Races made from solid, special analysis steel. Specially selected alloy steel balls. Maximum size and greatest number of balls. Greatest bearing surface between race and balls. Closest limits of guaranteed accuracy.

Now used in motor cars, machinery, and to equip our Special Shaft Hangers. We also make plain and grooved thrust bearings.

WRITE FOR BOOKLET M

SUSPENSION ROLLER BEARING CO., Sandusky, Ohio



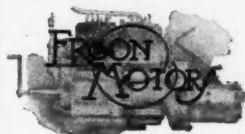
No Automobile is Completely Equipped without it.

The Stewart Piston Gasoline Saver

Saves up to 40% 20% Guaranteed
INCREASES POWER INCREASES SPEED
SAVES YOUR BRAKES

Price \$6.50 Anywhere in the U. S. Ask your dealer, or write us.

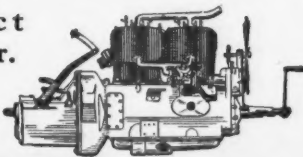
HALLIWELL CO. 408 West Pico Street
Los Angeles, California



Ergon Motors are "work" motors. Their Simplicity of design assures long life and ample power.

We never over contract our ability to deliver.

Three models. Model C, 3 3/4 x 4 1/2; model CX, 4 x 4 1/2; model D, 4 3/8 x 6.



ERGON MOTOR MANUFACTURING COMPANY



THE THOROUGHbred CAR

*Electric Self-cranking, Electrically Lighted
Four Forward Speeds*

"Six Thirty-six" Touring Car and Roadster, \$1850
Model 30 Touring Car...\$1350 Model 30 Roadster...\$1250

LIVE WIRE DEALERS
WRITE FOR UNALLOTTED TERRITORY

HERRESHOFF MOTOR COMPANY

Detroit, Michigan, U. S. A.

DUPLEX

EXTERNAL BRAKES

ACT INSTANTLY

Whether car goes
backward or forward

The Royal Equipment Co.
Bridgeport, Conn



The Searchlight Gas Co.

1016 Karpen Building

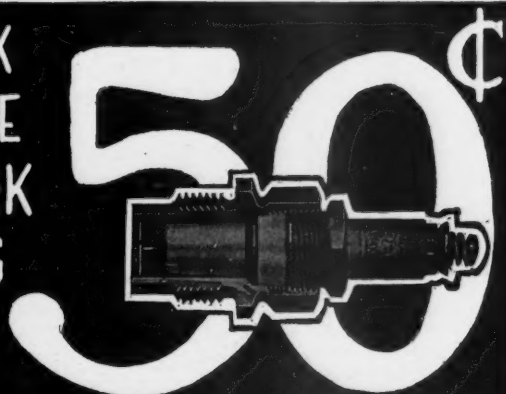
CHICAGO, ILLINOIS

Stronger than ever, legally, financially and in the esteem of the trade. Watch us grow.

BRANCHES AND REFILLING STATIONS:

| | | |
|-------------------|-----------------------|---------------------|
| Warren, Ohio | San Francisco, Calif. | Los Angeles, Calif. |
| Chicago, Ill. | Buffalo, N. Y. | New York City |
| Detroit, Mich. | Atlanta, Ga. | Syracuse, N. Y. |
| Camden, N. J. | Dallas, Texas | Minneapolis, Minn. |
| Philadelphia, Pa. | San Antonio, Tex. | Toronto, Canada |
| Kansas City, Mo. | Boston, Mass. | Indianapolis, Ind. |

BLACK
EAGLE
SPARK
PLUG



The STANDARD COMPANY Torrington, Conn.

OUR 1914 Models will be revelations in mechanical features, refinements, finish, specifications, accessories and prices. Write for latest catalog and agency proposition for 1914.

Pullman Motor Car Co.
York, Pa.



S. R. O.

Oldest and Leading European
Ball Bearing

Mea Magneto

Write for Particulars
and List of Users

MARBURG BROTHERS, Inc.

Sole Importers

Detroit 1790 Broadway, New York Chicago

Is Electricity Cheaper than Gas Light?

How much does a battery cost? How long are batteries lasting? How much do other repairs and replacements cost?

The average user of Prest-O-Lite pays \$10 a year, or less, for light.

If any editor, or any advertiser, claims that electric lights cost less to use than Prest-O-Lite, you can easily prove that he is either ignorant or worse.

If you want the facts, write us.

The Prest-O-Lite Co., 233 Speedway
Indianapolis, Ind.



"Twenty-Five" \$900

Long Stroke Motor, Big Roomy English Body, Center Control, Left Hand Drive, Every Necessary Accessory—And a Wonderful Economy Record.

Five Passenger Touring Car, 110" wheelbase....\$ 900 f. o. b. Detroit
Two Passenger Roadster, 110" wheelbase..... 900 f. o. b. Detroit
Three Passenger Coupe, 110" wheelbase..... 1300 f. o. b. Detroit

R-C-H CORPORATION

101 LYCASTE STREET, DETROIT, MICHIGAN

W
A
R
N
E
R

We Specialize in High-grade Automobile Parts

Transmissions
Steering Gears
Gear Shift Levers
Differentials
Electric Starters

The Warner Manufacturing Co.
TOLEDO, O.

T
O
L
E
D
O

RUDGE-WHITWORTH DETACHABLE WIRE WHEELS

Fitted With **HOUK** Quick
Detachable Rims

Make for greater resiliency, smoother riding. Save tires. Are quickly and easily removed. Practically indestructible. Absolutely rust-proof. Now being manufactured in America by the Standard Roller Bearing Company, of Philadelphia.

GEO. W. HOUK CO.

5002 LANCASTER AVE., PHILADELPHIA, PA.

Oakland

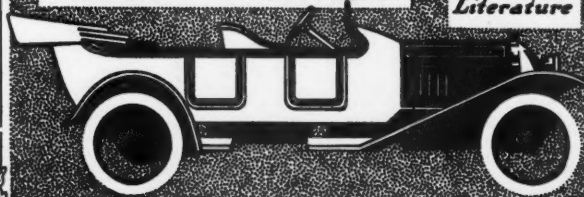
The Car with a Conscience

OAKLAND MOTOR CAR CO.
PONTIAC MICHIGAN

Four & Six
Cylinders
\$1000.

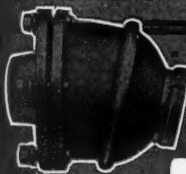
to
\$3000.

Write for
Literature



Spicer Universal Joints

DUST PROOF
OIL TIGHT



SPICER MANUFACTURING CO.

DOMESTIC REPRESENTATIVES
K. Franklin Peterson, 122 S. Mich. Blvd., Chicago
Thos. J. Wetzel.....17 West 42nd St., New York
L. D. Bolton, 2215 Dime Savings Bank Bldg.,
Detroit

FOREIGN REPRESENTATIVE
Benjamin Whittaker.....21 State St., New York

Safety First

Take no chances on Slippery
Pavements and muddy roads.

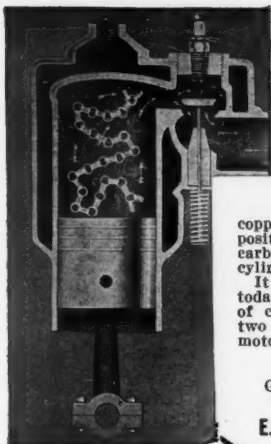
Equip all four tires with

Weed Anti-Skid Chains

Universally used—Increasing demand—Easily
handled—No dull season—No dead stocks.

Sold by all Reputable Dealers

WEED CHAIN TIRE GRIP COMPANY, NEW YORK



Shows Chain in Operation

Over 3000

Jobbers and Dealers in the United States Now Recommend and Sell the Michener Chain Carbon Remover.

Being a flexible chain, made of a light gauge wire, a special composition, 90% copper, it cannot scratch or score a cylinder. I positively guarantee that it will remove all the carbon from the piston head, top and sides of cylinders without injury to the motor.

It is the only carbon remover on the market today that will absolutely remove the hard scales of carbon. Get two chains and you can clean two cylinders at the same time. State kind of motor when ordering.

Price 75c, or 3 for \$2.00

Get them from your dealer, or if he cannot supply you, I will send direct postpaid.

E. S. MICHENER, WASHINGTON ST., NEW CASTLE, PA.

SHELDON

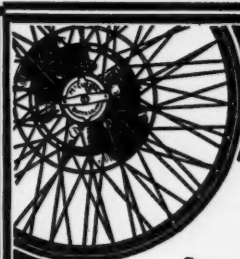
AXLES & SPRINGS
ARE
INVINCIBLE

THE SHELDON AXLE CO.
WILKES-BARRE, PA.
CHICAGO OFFICE: 68 East 12th Street.
DETROIT OFFICE: 1215 Woodward Ave

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 35 horsepower four-cylinder car of modern refinements priced at only \$1095.

R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., LANSING, MICH.



M'CUE
WIRE
WHEELS

Add a Big Percentage
of Tire Mileage

Strong, Resilient, Indestructible

These wheels are equipped with S Standard Spokes, made by the Standard Company of Torrington, Conn.

THE M'CUE COMPANY
Buffalo New York

KRUPP AUTOMOBILE CRANK SHAFTS, STEEL FORGINGS AND FRAME MEMBERS, GEAR BLANKS, KRUPP BAR STEEL BALL MILLS, TUBE MILLS AND OTHER MACHINERY

KRUPP RESISTANCE WIRE

USE



STEEL

Call for Krupp Steel In Your Car and
See That You Get It

THOMAS PROSSER & SON

28 PLATT STREET

NEW YORK

CRILLED IRON ROLLERS

KRUPP STEEL LOCOMOTIVE TIRES AND CAR WHEEL TIRES, CRANK SHAFTS, STEEL FORGINGS AND CASTINGS, STEEL TIERED CAR WHEELS, PROSSER BOILER TUBE EXPANDERS

LOZIER

"The Choice of
Men Who Know"

"SIX"

\$3250

A big, roomy, completely equipped "Six" which will satisfy the man who wants the highest class, most distinguished looking motor car obtainable.

"FOUR"

\$2100. Deliveries Jan. 1, 1914. A true Lozier in every detail, 7 passengers, Gray and Davis Electric Starting and Lighting. Completely equipped. Meets the want of the thousands of motorists who have always longed to own a Lozier, but who have been prevented by the cost.

Lozier Motor Company, Detroit

THE COAST LINE TO MACKINAC

THE CHARM OF OUR SUMMER SEAS

Spent your vacation on the Great Lakes

The most economical and enjoyable outing in America

WHERE YOU CAN GO—Daily service is operated between Detroit and Cleveland, Detroit and Buffalo; four trips weekly between Toledo, Detroit, Mackinac Island and way ports. 10 day stopover allowed at Alpena either direction on tourist tickets without additional cost. Daily service between Toledo, Cleveland and Put-In-Bay. During July and August, two boats out of Cleveland and Detroit, every Saturday and Sunday night.

A Cleveland to Mackinac special steamer will be operated two trips weekly from June 15th to September 10th, stopping only at Detroit every trip and Goderich, Ont., every Monday up-bound and Saturday down-bound. Railroad Tickets Available on Steamers. Special Day Trips Between Detroit and Cleveland, During July and August.

Send your name for illustrated Prospect and Great Lakes Map Address: L. C. Lewis, G. P. A., Detroit, Mich.

Philip H. McMillan, Pres.
A. A. Schantz, Vice-Pres. and Gen'l Mgr.

DETROIT & CLEVELAND NAVIGATION CO.

DETROIT CLEVELAND BUFFALO NIAGARA FALLS TOLEDO PORT HURON GODERICH ALPENA ST. IGNACE

D&C

Cross-Rolled Steel in Springs Cuts Up-Keep

In this new process, the steel is worked both longitudinally and transversely. So we get superior strength and toughness. We use this process exclusively in our Chrome-Vanadium Brand of Springs.

Find out more about them. It will make a tremendous difference in the riding qualities of your car.

Best Grade—Chrome-Vanadium
Next Best—Special Analysis

The Cleveland-Canton Spring Co., Canton, Ohio, U.S.A.



In five years not one Cleveland - Canton Chrome - Vanadium spring returned because of breakage or settling.

Let us send you full particulars

LINDHE "LAMINATED" SHIM METAL
 PATENTED IN U.S.A. AND ALL FOREIGN COUNTRIES
 STOCK SHEETS 6" WIDE BY 36" LONG

LINDHE "LAMINATED" SHIMMING BRASS

with Laminations of .002" or of .003".

For Adjustments of Bearings. No More Filing.

A perfect reduction is obtained at once simply by loosening one corner of a layer with a knife or other sharp instrument and peeling it off. The rest of the shim remains as solid as ever.

Stock Sheets and Box Assortments of Strips—On sale

by all leading Jobbers and Dealers.

Special stamped shapes supplied to manufacturers when desired.

LINDHE SHIM CO., 210-212 Canal St., NEW YORK

RHINELAND MACHINE WORKS CO., 140 W. 42d St., N. Y.
 (Sales Agents for the United States)

Inter-State

Model 45, \$2750

6 Cylinder, Left-hand Drive

Center Control

132-inch Wheel Base.

INTER-STATE AUTOMOBILE CO.
 MUNCIE, INDIANA

STAPLEY

TIRE PUMP

Made by Bridgeport Brass Co.

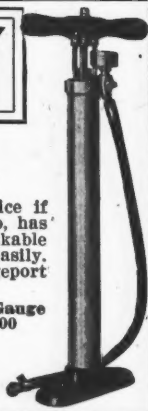
Means Tire Economy

You will get more mileage and better service if you use the Stapley. It is a compound pump, has seamless brass tube cylinders and non-leakable joints. Inflates your tires quickly and easily. Everything about the Stapley up to the Bridgeport Brass Co. Standard of Quality.

Price Without Gauge \$4.00

With Gauge \$6.00

THE BRIDGEPORT BRASS CO.
 P. O. Station A Bridgeport, Conn.



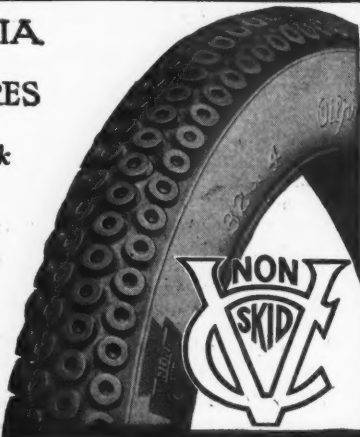
PENNSYLVANIA
Oilproof
 VACUUM CUP TIRES

Making Their Mark
 Everywhere

Pennsylvania Rubber
 Company

Jeanette Pa.

An independent company with
 an independent selling policy



From Your Viewpoint

Our agency agreements are made after studying the proposition from your point of view. You will have a year 'round sale for

The Borland Electric

We will give you a hearty co-operation, including local advertising. A splendid car backed by a company of unusual financial stability. Write for agency terms and literature.

Our discounts are right.

The Borland-Grannis Co.

Executive Offices and Factory

310 E. Huron St., Chicago, Ill.

EISEMANN

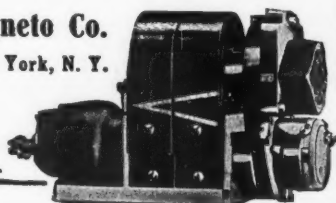
Automatic Spark Control

Quality—not only as to efficiency and manufacture, but in design as well—characterizes all Eisemann Ignition systems. Not only do they insure hot fat sparks at all speeds—but they are simple, accessible and fool proof.

The Eisemann Magneto Co.

225-227 W. 57th St., New York, N. Y.

Indianapolis,
 514 North Capitol Ave.,
 Detroit,
 508 Woodward Ave.

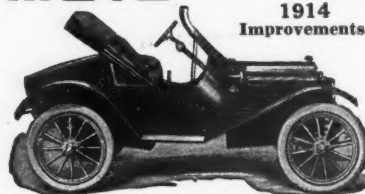


METZ "Twenty-Two" Roadster

THE GEARLESS CAR

1914
 Improvements

"No clutch to slip—no gears to strip."



\$475

Completely Equipped

Center control, left-hand drive, 4-cylinder 22½ H. P. water cooled motor, Bosch magneto, standard artillery wheels, best quality clincher tires, extension top, windshield, five lamps, gas generator, tools, etc. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline, climbs hills as fast as ANY stock car made. A strong, reliable, stylish, fully guaranteed car. You can secure EXCLUSIVE SALE in your territory. Write at once for Book "K" and particulars.

METZ COMPANY

WALTHAM, MASS., U. S. A.

The Name "MOON"
 has become synonymous
 with honest construction
 in motor cars—it's selling
 lots of cars for MOON
 dealers.

MOON "39," completely equipped, \$1,650
 MOON "48," completely equipped, \$1,985

MOON MOTOR CAR CO., St. Louis

THE
MASTER
CAR

FIAT 16th
YEAR

6 Cyl. 50 H. P. \$5000
4 Cyl. 55 H. P. \$4500
4 Cyl. 35 H. P. \$4000

F. I. A. T.

POUGHKEEPSIE

NEW YORK

No Danger



In a situation like
this there's no danger of collision
when your brakes are equipped with

J-M Non-Burn Brake Lining

Stops car almost instantly in emergencies. Never slips. Water, grease or gasoline can't affect its gripping power. Frictional heat can't burn it. Outlasts 12 ordinary linings. Made of asbestos fibre interwoven with strong brass wire.

Write Nearest Branch for Booklet and Sample

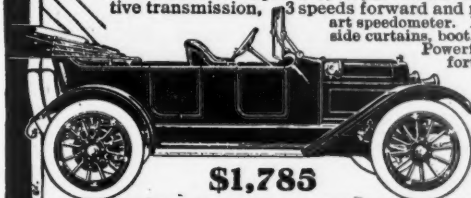
H. W. JOHNS-MANVILLE CO.

| | | | | | |
|-----------|------------|--------------|-------------|--------------|---------------|
| Albany | Chicago | Detroit | Louisville | New York | San Francisco |
| Baltimore | Cincinnati | Indianapolis | Milwaukee | Omaha | Seattle |
| Poston | Cleveland | Kansas City | Minneapolis | Philadelphia | St. Louis |
| Buffalo | Dallas | Los Angeles | New Orleans | Pittsburgh | Syracuse 2055 |

The Kentucky
Thoroughbred

Ames "45"

With Electric Self-Starter. An Electric Starter of proved efficiency is one of the features of the Ames "45"—a car with every essential refinement contributing to comfort, yet priced at \$1,785. Without Starter, electric lighted \$1,635. Made with well-known "Amesbilt" body. 5-passenger, motor-driven electric lights. Perfect cooling system. Force-feed pump. Schebler Carburetor, new Remy dual system high tension magneto, oil-driven pumps. Sight-feed. Warner multiple disc, Raybestos-lined clutch. Selective transmission, 3 speeds forward and reverse. Stewart speedometer. Best mohair top, side curtains, boot. 36x4-inch Tires



\$1,785

Powerful, speedy—comfortable—unequaled at price. Write for catalog.
AMES MOTOR CAR COMPANY
Owensboro, Ky.
(19)

DIXON'S

Motor Graphite



Introduced between tube and shoe does not injure the rubber (as does soapstone), materially reduces the heating due to friction, and lengthens the life of the tire. Blow-outs are practically unknown where Dixon's Motor Graphite is used. This—with other automobile economies—is explained in "Lubricating The Motor" No. 82—a book every autoist should have.

Made in JERSEY CITY, N. J., by the

JOSEPH DIXON CRUCIBLE CO.

Established 1827

THE
RUTENBER
MOTOR

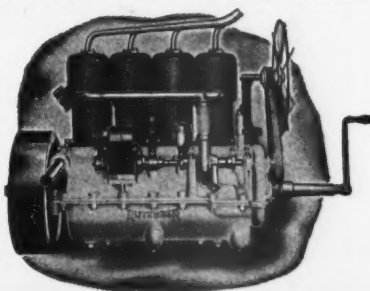
MANUFACTURED SINCE 1901 FOR HIGH GRADE
AUTOMOBILES and TRUCKS

3 1/2 x 5 1/2 four and six cyl.
4 1/2 x 5 1/2 four and six cyl.
Standard or Unit
and

4 x 4, 4 1/2 x 5 and 4 1/2 x 5
Standard Types. All L
Head 4 Cycle.

Manufacturers are invited
to investigate our service
and our facilities. Literature
on request.

**The Rutenber
Motor Company**
Marion, Indiana



IDEAL STEEL WHEEL

(RESILIENT)

STRENGTH
COMFORT

BEAUTY
ECONOMY

IT'S IN THE SPOKES

Makes possible the use of airless tires without sacrifice of easy riding.

Doubles the life of any set of tires.

Increases life of motor and adds to the mileage per gallon of gasoline or per charge of electricity.

Makes any car ride like a cradle.

TRY THEM AT OUR RISK

Supply Dealers and Garage Owners:
Write for our agency proposition.

The Ideal Steel Wheel Company

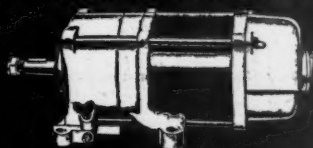
4619-4633 Spring Grove Ave.

Cincinnati

JESCO
TRADE MARK

**ELECTRIC
STARTING
& LIGHTING**

ASSURES 100% EFFICIENCY

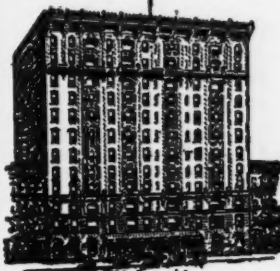


JONES ELECTRIC STARTER CO.
ADAMS & LOOMIS STS. CHICAGO, ILL.

You
Can
Walk
From
There
to
Any-
where.

THE WOODSTOCK The Hotel
of Comfort

43rd St., Just East of Broadway, New York



Our new addition is ready for occupancy. We now have 360 rooms with 265 baths. Write us for descriptive folder with typical floor plan and rate card. Wire for reservation at our expense.

Rates

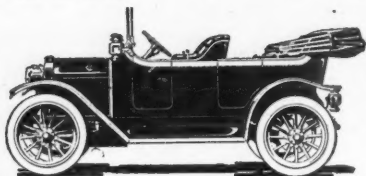
From \$2.50 to \$4.00 Per Day

W. H. VALIQUETTE
MANAGER

Also The Berwick, Rutland, Vt.

The *Detroit* — \$850 FULLY EQUIPPED

Five
Passenger
Touring
Car



25 H. P.
Long
Stroke
Motor

Enclosed Valves, Three Point Suspension, Unit Power Plant, Platform Rear Springs, Full Floating Rear Axle, Left Hand Drive, Center Control, Drop Frame, Large Tires, Complete Ball Bearing Car

BRIGGS-DETROIT COMPANY, 455 HOLBROOK AVE., DETROIT, MICH.
WRITE FOR SPECIFICATIONS

Elyria-Dean

TRADE MARK

Rexo Single-tone electric horn guaranteed for life—instantly responsive—eliminates constant care and adjustment.

Rexo Horn Electric Warning Signal
Guaranteed

Elyria-Dean products mfd. only by

THE DEAN ELECTRIC COMPANY
504 OLIVE STREET ELYRIA, OHIO, U. S. A.
Kansas City San Francisco, Cal.

"Look for Elyria-Dean where Quality's seen."

Hupmobile

| | |
|-----------------------------------|---------|
| "32" Touring Car..... | \$1,000 |
| "32" 6-Passenger Touring Car..... | 1,200 |
| "32" Roadster | 1,000 |
| "32" Covered Delivery..... | 1,075 |
| "20" Runabout | 750 |

All models F. O. B. Detroit. Fully equipped
Literature sent upon request

HUPP MOTOR CAR COMPANY
1228 Milwaukee Avenue Detroit, Michigan

"VULCAN" SPRINGS

THE GOOD KIND



When next you are needing Automobile springs, we ask you to consider the Vulcan—a thoroughly good spring.

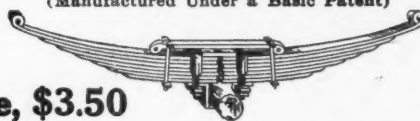
Stock on Hand to Fit:

| | | |
|----------|----------|----------|
| Ford | Maxwell | Hudson |
| Overland | E. M. F. | Chalmers |
| Buick | Flanders | Oakland |
| Reo | Hupp | R. C. H. |
| Cadillac | Regal | Everett |

JENKINS MFG. COMPANY
118 N. Third St. ST. LOUIS, MO.

No Other Accessory Near So Essential as the
TRADE **KANTALEVER** MARK
Emergency Spring Repairer

(Manufactured Under a Basic Patent)



Price, \$3.50

Repairer attached to spring broken in center at spring bolt—a common occurrence. Taken in time by attaching Spring Repairer there need be no cause for alarm. May be placed in other positions wherever springs are broken.

THE MOTOR CAR EQUIPMENT COMPANY
Sole Manufacturers
55-C Warren Street New York City

SCHAFFER BALL BEARINGS

MADE IN GERMANY SOLD IN AMERICA



When you buy SCHAFFER BALL BEARINGS you are not experimenting because SCHAFFER BALL BEARINGS have for years been recognized as the standard of bearing quality. They are made in Germany of the best steel, and are now in universal use throughout the world.

BARTHEL & DALY

42 BROADWAY

NEW YORK

The New Swinehart


KEATON NON-SKID TREAD

has four times the wearing service of the ordinary non-skid. Users will tell you that they have run Swinehart Keaton Non-Skid Tread Tires a whole season without having them lose their anti-skid effectiveness. Call at any one of our stores and investigate them. We also make a complete line of Smooth Pneumatic Tires of best quality. Branches and distributing agencies in all leading cities.

SWINEHART TIRE & RUBBER COMPANY
1206 North St., Akron, Ohio

Corcoran Lamps

GAS, OIL, AND ELECTRIC



Dorris
Built to Last
THE SILENT CAR
BUILT TO LAST

Our agency proposition will interest you. Write for it.

DORRIS MOTOR CAR COMPANY
100 S. Sarah Street St. Louis, Mo.

The Kinsey Manufacturing Company, Toledo, Ohio

MANUFACTURERS OF AUTO PARTS

KINWOOD RADIATORS, FENDERS
KINWOOD OILERS, GASKETS,
KINWOOD STEEL FRAMES,
ETC., ETC.

SPECIAL METAL STAMPINGS

McFARLAN

Electric Lighted **SIX** Self Starting

SERIES "S"—45 H. P., 2, 4 and 5 Pass.—\$2,300
SERIES "T"—50 H. P., 2, 4 and 5 Pass.—\$2,500
SERIES "M"—60 H. P., 2, 4, 5 and 7 Pass.—\$2,750

New Six Passenger, Coupe and Limousine
Bodies slightly higher.

TERRITORY OPEN FOR PROGRESSIVE DEALERS
Pioneer Six-Cylinder Car Builders of America
McFARLAN MOTOR CAR CO., Connersville, Ind.

AUBURN 1913

"Rides Like a Pullman—Pulls Like a Locomotive"

38 Years' Manufacturing Experience
Built Into Every Model

Model 33M—Two Passenger Roadster; 33 H. P. long stroke motor $3\frac{1}{2} \times 5\frac{1}{2}$ — Price, \$1150.

Model 40L—Five Passenger Touring Car; 40 H. P. long stroke motor $4\frac{1}{2} \times 6$ — Price, \$1650.

Model 33L—Five Passenger Touring Car; 33 H. P. long stroke motor $3\frac{1}{2} \times 5\frac{1}{2}$ — Price, \$1150.

Model Six—45B—Two Passenger Roadster, 45 H. P. long stroke motor $3\frac{1}{2} \times 5\frac{1}{2}$ — Price, \$2000.

Model 40A—Two Passenger Roadster; 40 H. P. long stroke motor $4\frac{1}{2} \times 5$ — Price, \$1650.

Model Six—45—Five Passenger Touring Car, 45 H. P. long stroke motor $3\frac{1}{2} \times 5\frac{1}{2}$ — Price, \$2000.

Model Six—50—Six-Cylinder Touring Car, 50 H. P. long stroke motor $4\frac{1}{2} \times 5\frac{1}{2}$ — Price, \$3000

Send for 1913 Catalog

AUBURN AUTOMOBILE COMPANY, Auburn, Ind.



*Gearless!
Not even a clutch!
The simplest car made—
unlimited speeds—one lever
control—climbs steep hills.
Twice the usual tire mileage.
Send for Catalog—
Cartercar Company,
Pontiac,
Michigan*



Quality Counts

in automobile tires as it does nowhere else. We build Republic tires on the *quality* basis from the ground up. This is why you will find Republic Tires on the cars of men who know real tire values.

The Republic Rubber Company, Youngstown, O.
BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES

**REPUBLIC
STAGGARD
TREAD TIRES**

Republic Staggard Tread, Pat. Sept. 15-22, 1908



**We Ship On Approval
PREPAY EXPRESS AND ALLOW
30 Days' Free Trial**

The best "Nonskid" puncture-proof device for automobiles, commercial cars and motorcycles.

Try Them At Our Expense

Be your own judge—don't take any one's word for it. "The proof of the pudding is in the eating."

Perfect Score in 4 Glidden Tours.

Twin Cities to Fargo, N. D., 1909.

Twin Cities to Helena, Mont., 1911.

New York City to Jacksonville, Fla., 1911.

Twin Cities to Winnipeg, 1912.

It only costs one cent to learn our prices and guarantee on "Bricton" Detachable Treads.

Write today for full particulars

The Bricton Mfg. Co.

1283 Main St.

BROOKINGS, S. D.

★ STAR BALL RETAINERS ★

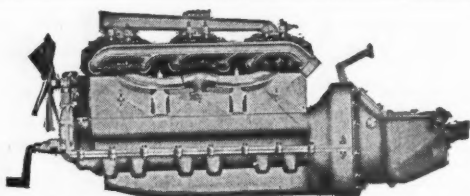
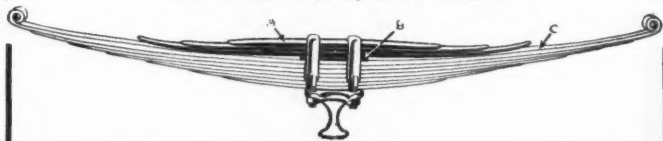
STAR BALL RETAINERS are famous wherever ball bearings are known. The best bearing service attends the car equipped with STAR BALL RETAINERS. We also manufacture more thrust bearings than any concern on the market. Send us your requirements.

THE STAR BALL RETAINER CO.
LANCASTER, PA.

For fifteen years, automobile engineers have seen no occasion to improve on leaf type construction for absorbing shock.

The AMES AUTOMATIC SHOCK ABSORBER

Clarence N. Peacock & Co. Exclusive Licensees
1788 BROADWAY, NEW YORK



BEAVER "SIX" Unit Power Plant

Beaver "Sixes" offer the following 1914 features: long stroke (3 1/4 x 5); just right power, 45 H. P.; 3-point suspension; large valves with enclosed action; enclosed fly wheel; 3-speed transmission; noiseless, vibrationless, oil and dust tight action; arrangement for installation of any make Electric Starting and Lighting System. Write for catalog and prices.

BEAVER MANUFACTURING CO.

Builders of 2, 4 and 6 Cylinder Motors
2800 First Avenue MILWAUKEE, WIS.

PAIGE

Model "36" \$1275.00

A car whose design and construction is so far ahead of others at its price that it is in a class all its own.

Gray and Davis Electric starting and lighting equipment, silent chain cam shaft drive, four inch by five inch motor, cork insert multiple disc clutch, 116 inch wheel base, left side drive, center control, and equipment complete to the last detail.

Model "25" \$950.00

Electric Starting and Lighting System \$75.00 Extra

This model has made the Paige reputation. Such a sturdy, powerful comfortable car has never been offered the public at anywhere near its price. \$950.00 with complete equipment.

Splendid Agency Proposition

PAIGE-DETROIT MOTOR CAR CO., 304 Twenty First St., Detroit, Mich.

SKID BLOWOUTS RIMCUTS PUNCTURES WEARING OFF OF RUBBER NIT

Each section 2 in. wide. They hook to rims. Try two or three sections over any old blowout.

Special Prices to the First in New Territory

KIMBALL TIRE CASE CO., 173 B.W., COUNCIL BLUFFS, IA.



Simplicity the Supreme Factor

THE simpler your truck, the more you save. Chase Trucks could not be made more simple—their engines have only three moving parts in the cylinder. Hence our enormous light delivery sales—greater both this year and last year than any other manufacturer.

Write Dept. H-5 for complete information.

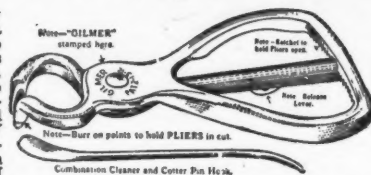
Six Efficient Models Every Style of Body Capacities 500 to 4000 Lbs.

Chase Motor Truck Company
503 So. West St. Syracuse, N. Y.

GILMER Tire Repair Pliers

are as necessary to Car Users as a pocket knife is to you—as useful as a hair pin to a woman. There are 300,000 Car Owners in the United States who KNOW that it pays to repair small cuts in Tires. ARE YOU ONE OF THEM?

Hadn't you best write for free copy of "Tire Insurance," or better, send a dollar for a pair of nickel plated PLIERS and combination cleaner and cotter pin hook. They will pay for themselves the first seventy-five miles. They will pay for a set of Tires every 4,000 miles. We guarantee satisfaction.



G. WALKER GILMER, Jr.

53 North 7th Street

Philadelphia, Pa.

SPLITDORF

"Always There"

The SPLITDORF "TS" TRANSFORMER is interchangeable with any type tube or dash coil and can be attached to any car. We will make a very liberal allowance on an old coil in exchange for one of the new style.

Write TO-DAY for particulars

SPLITDORF ELECTRICAL CO.

98 Warren Street, Newark, N. J.

REG. U.S. PAT. OFFICE

MAGNETO PLUG

All Sizes All Styles Porcelain or Mica \$1.00

EMIL GROSSMAN COMPANY
Manufacturer
250 West 54th Street
NEW YORK
Detroit Branch and Factory
844 Woodward Avenue

The Pilot "THE CAR AHEAD"

Three Great Models: Pilot 40—Four cylinders, 4½x5; brake test, 53 horse-power; 120" wheel base; price, \$2000. Pilot 50—Four cylinders, 4½x6; brake test, 59 horse-power; 126" wheel base; price, \$2250. Pilot 60—Six cylinder, 4x6; brake test, 67 horse-power; 132" wheel base; price, \$2500.

The Car Without a Mechanical Defect

Tester "T" head motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Elsemann magneto, Stromberg carburetor, handsome jewel bodies with ventilating windshield. Completely equipped, with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States.

Write for our beautiful art book showing cars in detail

PILOT CAR SALES COMPANY

Richmond, Indiana

Simplicity, Strength, Durability—



Three important points in Covert Transmissions

You would not think of putting an inferior motor in your car, would you? Superior transmissions are essential as the best motors.

COVERT MOTOR VEHICLE CO.

Sales Office:

Ford Building, Detroit

Factory: Lockport, N. Y.



Patented

Manufacturers Don't omit a SPARKS-WITHINGTON Fan from your 1913 specifications. Our One-Piece blade, ball-bearing, radiator fan assemblies cool the motors of more high-class cars than any other fan on the market. There's a reason. SPARKS-WITHINGTON Fans deliver the greatest volume of air with the least H. P. consumption of any fan obtainable. Furthermore, their one-piece construction is positive insurance against blades which loosen, become detached and fly off. Undoubtedly one of our ten standard models is just what you have been looking for. Catalogue and detailed blue-prints on request. Get in touch with us.

The Sparks-Withington Co.
JACKSON MICHIGAN - WALKERVILLE, CAN.

WARD-LEONARD SYSTEM

WARD-LEONARD



Lighting - Starting

**Faultless Lighting
Infallible Starting**

WARD-LEONARD ELECTRIC CO.
BRONXVILLE N. Y.

HESS AXLES

¶ HESS Axles have been on the market but 2 years. Fourteen car manufacturers in that short time exclusively adopted them as regular equipment.

¶ Renewals of HESS contracts for 1913 from past users and an increasing HESS demand among new manufacturers, is ample proof of the stability of HESS Quality.

¶ May we be of service to you? Write us.

THE HESS SPRING & AXLE COMPANY
Carthage, Ohio, U. S. A.

SOLAR LAMPS

A discriminating public has voted in favor of Solars—the quality motor lamps.

Backed by 15 years of specialization. Found on more high-grade cars than all other makes of lamps.

A Solar Lamp for every motor need.

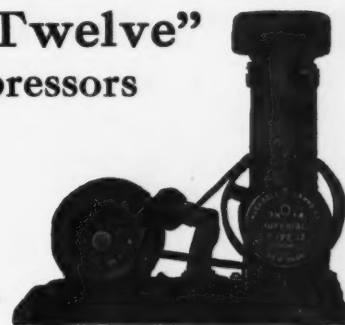
WRITE FOR CATALOG

THE BADGER BRASS MFG. CO.
KENOSHA, WIS. NEW YORK CITY

"Imperial Twelve" Garage Compressors

A high-class car equipment deserves high-class garage equipment. The quality of these little compressors is such as to appeal to the most discriminating buyers.

Booklet 608



Ingersoll-Rand Company
New York London



Bull Dog
Non-Skid

Braender Tires & Tubes

Service and Satisfaction

They are built to last and
cheapest on mileage

Established Agents Solicited

BRAENDER RUBBER & TIRE CO.

Main Office and Factory
RUTHERFORD, N. J.

Salesrooms: 1987 Broadway, N. Y.
1211 Bedford Avenue, Brooklyn, N. Y.

You can take a thousand miles of service out of a set of tires by driving them insufficiently inflated over ten miles of road.

Use the New Positive Lock Stop
TWITCHELL AIR GAUGE
and saves your tires.



"TIRE INSURANCE FOR \$1.00"

Simple, Accurate, Durable and Easily Read

For sale by Jobbers, Dealers, Garages, or

The Twitchell Gauge Co.

1201 Michigan Avenue

Chicago, Illinois

Economy is too big a matter to be found lurking in cheap prices.



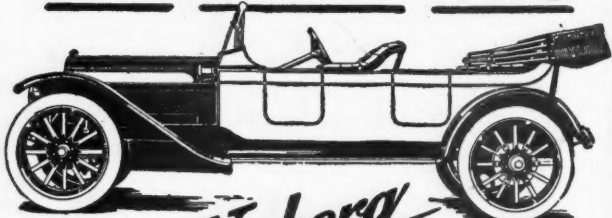
TRADE MARK
NON-FLUID OIL
REGISTERED
UNITED STATES PATENT OFFICE

Costs more than other lubricants for bearings and gears but its use reveals true Economy in dollars saved on repairs and in Efficiency retained in your car.

NEW YORK & NEW JERSEY LUBRICANT CO.

165 Broadway, New York
Chicago, 1430 Michigan Ave. Philadelphia, 1431 Vine St.

Your Motor Car!



Electric Starter
Electric Lights
Center Control
Complete Equipment

Nyberg

SIX \$2000
FOUR \$1650

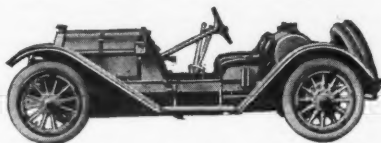
NYBERG AUTOMOBILE WORKS

Northern Factory
Anderson, Indiana

Chicago Branch
2437-2439 Michigan Ave.

Southern Factory
Chattanooga, Tenn.

Type 35
Series J
Race-
about



Guaranteed Speed
—Mile in
51 Seconds

MERCER

The Mercer's speed and endurance record at Indianapolis and other important contests is a valuable asset from the dealer's viewpoint.

Some desirable territory open. Write today

Mercer Automobile Company

800 Whitehead Road
TRENTON, N. J.

FORD OWNERS The 'BLITZ' Ignition System



Stops all of your ignition troubles.
Makes your car more efficient.
Uses Ford magneto current.
Eliminates the back kick.

Price \$20.00

**Electrical Specialties
Mfg. Co.**

Omaha, Neb.

AJAX

Mileage Contest

\$5000 in Cash Prizes

For full particulars address

AJAX-GRIEB RUBBER CO.

1796 BROADWAY, NEW YORK

HAYWOOD STEAM VULCANIZERS

THE PROFIT MAKING PLANTS



The vulcanizing system that DOES NOT use air bags. SOLID PADS and HEAVY CLAMPS are the means through which pressure is generated.

Plants from
\$25 to \$500

Write for Catalog B.

HAYWOOD TIRE & EQUIPMENT COMPANY
524 N. Capitol, Indianapolis, Indiana

ZENITH

Gives Standard Carburetion

ZENITH CARBURETOR CO.
DETROIT, MICH.

The Buyers Guide

A Directory for the Guidance of Motor Age Readers

FORD DEALERS

Have you received our 1913 Ford supplement? Full line of new goods for Ford cars. Also other new goods.

Prompt shipments—our policy

Chicago Automobile Supply House
1855 So. Michigan Blvd., Chicago, Illinois

IF YOU TRY ONE YOU WILL WANT MORE
Critchley's Expanding Reamer



Reams Odd-Sized Holes

Chadwick & Trefethen, Portsmouth, N. H.

AUTO-TOP
FABRICS OF EVERY DESCRIPTION

SAMPLES AND PRICES ON REQUEST

L. J. MUTTY CO., Boston

Polarine
FRICTION REDUCING MOTOR OIL

Maintains the correct lubricating body at any motor speed or heat.

STANDARD OIL COMPANY
(An Indiana Corporation)

NATIONAL POWER PUMPS
"MADE TO WEAR AND PUMP FRESH AIR"

The only spark plug pump which does not fill your tires with gas. Compare and test it with any other pump on the market and we will get your order. Write for complete description today.

Made by

THE NATIONAL MOTOR SUPPLY CO.
1919 EUCLID AVE., CLEVELAND, OHIO



MODERN
AUTO APPLIANCE CO.
Chatham, N. Y.

A helical spring made of oil tempered steel wire, attached as illustrated, makes any car easier to control and helps prevent accidents. You should have one. Ask your dealer or write for full information.

WILLIAMS'
VENTILATING
WINDSHIELD

20th Century Motor Car Supply Co.
South Bend, Ind.

ALWAYS SPECIFY

HOYT METERS



And Get Your Money's Worth

HOYT ELECTRICAL WORKS
INSTRUMENT
PENACOOK - NEW HAMPSHIRE

Get in Line Now

for the September 4th issue of Motor Age. This number will contain full report of the Elgin Races and is bound to be of double value to advertisers.

Better send your copy to us at once. Our advertising forms will close Tuesday, Sept. 2nd.

MOTOR AGE

910 S. Michigan Avenue Chicago

Automobile, Motorcycle and Bicycle Supplies

Ask for catalog "M"
Dealers only

THE BECKLEY-RALSTON CO.
Mich. Ave. & Randolph St., Chicago

AUTOMOBILE TOPS

Write for catalogue and prices. We can save you money.
BUOB & SCHEU, Court & B'way, Cincinnati, O.

—Buy BETTER Springs—

Guaranteed against breakage & sagging, at less price than that of car factories.

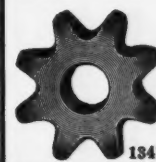


In stock, painted for Ford, Buick, Cadillac, Chalmers, Hudson, Maxwell, Regal, Reo, and others. Send for complete list and price.

TUTHILL SPRING CO., 762 Polk St., Chicago

SPROCKETS

Chains and Differential



In Stock or Order
Send for New Catalog
CULLMAN WHEEL CO.
1341 Greenwood Terrace, Chicago



"A Giant in Power
—A Miser in Fuel"

25% to 50% more mileage

Write for illustrated descriptive booklet.

Schoen Jackson Company, Media, Pa.

—Buy BETTER Springs—

Guaranteed against breakage and sagging at less price than of car factories.



Freight allowed on 4 or more. In stock, painted for Ford, Buick, Cadillac, Chalmers, Hudson, Maxwell, Regal, Reo, and others. Send for complete list and price.
NEW ERA SPRING & SPECIALTY COMPANY
247 Jefferson Ave., Detroit

R.I.V. BALL BEARINGS

NEW CATALOG 300 PAGES Now Ready

MOTOR CAR
MOTOR CYCLE
MACHINISTS' BICYCLE
SUPPLIES
AND BICYCLES

WHOLESALE ONLY DEALERS, GET YOUR NAME IN

MOTOR CAR SUPPLY COMPANY
1451-1453-1455 Michigan Ave., Chicago

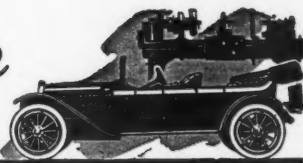
ESTABLISHED 1848.
SCHRADER
UNIVERSAL VALVES
TRADE MARK REGISTERED APRIL 30, 1895.
The Standard American Valves for Automobile, Bicycle & Vehicle Tires
Manufactured by
A. SCHRADER'S SONS, INC.
28-32 Rose Street New York, U. S. A.



The Clearing House

of the Motor Car Industry

For Second-hand Shop Equipment • Used Cars • Parts and Accessories



1" one time, \$4.50; 2" one time, \$8.75; 3" one time, \$13; 4" one time, \$16.75. Write for rates of larger spaces and longer terms.

Automobile BODIES Wanted

Ford and other small fore-door touring bodies. Write us if you want to buy or sell any kind of automobile body.

PAUL MURRAY

Automobile Body Broker

518 Indiana Trust Bldg. Indianapolis, Indiana

Automobile Owners, ATTENTION!

THE TOBIN WHICHWAY SAFETY SIGNAL is a Combination Tail Lamp, Number Plate Illuminator and Safety Signal.

The word "STOP" ground in red glass is flashed automatically every time you slow up or stop your car, so as to signal the car in the rear of your intention, doing away with signaling with the arm.

The signals are made in black nickel, white nickel, or brass, and sold under a positive guarantee of efficiency. Money back if not satisfied. Price \$7.50, complete, all ready for attachment to your car.

These signals may be secured at any Department Store or auto supply dealer or sent prepaid upon receipt of price.

Universal Signal & Supply Co.

12th Floor, Karpen Bldg.

Chicago

Times Square Auto Co.

WORLD'S LARGEST DEALERS IN NEW AND USED AUTOMOBILES AND ACCESSORIES

NEW YORK

S. W. Corner
B'way and 56th St.

CHICAGO

1210 Michigan
Boulevard

Don't Miss This Opportunity
Of Getting a Brand New

Guaranteed
\$1750 Car for - **\$835**

This is one of America's classiest little cars which we have secured and are selling at half list price. Equipped and fully guaranteed.

Motor Trucks

COMPLETE WITH BODY

Reg. Price. Our Price.

| | | |
|-----------------------|---------|----------------|
| 1 1/2 Ton Trucks..... | \$2,000 | \$1,300 |
| 3 Ton Trucks..... | 3,400 | 1,950 |
| 4 Ton Trucks..... | 4,250 | 2,250 |
| 5 Ton Trucks..... | 4,750 | 2,600 |

SPECIAL FOR THIS MONTH

DISCO Reg. Price - \$40
Self Starters Our Price **\$5**

Simple and reliable. Can be attached to any car without difficulty in a few moments. The regular price of this Starter is \$40. We will sell them while they last for\$5.00

Write for our Price Wrecker. It is a money saver and contains everything for the automobile at about half regular price.

Times Square Auto Co.

S.W. Cor. B'way, 56th St. 1210 Mich. Ave.
NEW YORK CITY CHICAGO

Extra Strength U-KAN-PLATE

applied to brassy looking nickel plated trims makes the car look almost new. All brass parts are kept a bright silver color by simply using Extra Strength "U-Kan-Plate" as a polish and cleanser. Deposits pure silver. No mercury. No acids. Agents wanted. Quart cans \$2, enough for car. Pint cans \$1.25, of dealers or by parcel post. Sample can 10c. A. R. Justice Co., 619 Chestnut St., Philadelphia.

TIRES — TIRES

All New 1913 Stock

Direct from leading tire manufacturers

WHILE THEY LAST

| Size. | Casing. | Tubing. | Rollers. |
|----------|---------|---------|----------|
| 28x3 | \$ 7.20 | \$1.90 | \$1.90 |
| 30x3 | 7.65 | 1.95 | 1.95 |
| 32x3 | 7.80 | 2.05 | 1.95 |
| 30x3 1/2 | 11.00 | 2.70 | 2.00 |
| 32x3 1/2 | 12.00 | 2.90 | 2.05 |
| 32x4 | 12.70 | 3.00 | 2.50 |
| 34x4 | 14.00 | 3.70 | 2.55 |
| 34x4 | 17.25 | 3.80 | 2.90 |
| 35x4 | 17.50 | 3.90 | 2.95 |

C. O. D. orders sent same day as received upon receipt of 10%, subject to your examination.

PARA AUTO TIRE CO.

Phone Calumet 2814

1419 MICHIGAN AVE.

CHICAGO

DEALERS!

Send for our new catalogue before buying accessories. We guarantee lowest prices consistent with quality.

M.M. Sales Company

READING, PA.

Special or Contract Work

and development of new ideas will receive our prompt attention. We have an entirely new equipment of turret lathes, broaching machines, worm and worm gear machines, lathes and other necessary tools, so that large contracts can be handled to advantage by us. Send blueprints or samples of articles you want manufactured, and we will give you figures on such articles, ready to ship.

UNIVERSAL MANUFACTURING CO.

1204 18th Street, RACINE, WISCONSIN

PULLMAN TIRES AND TUBES

Quality at a Minimum Cost
Every One Guaranteed

PULLMAN TIRE CO.

1268 Bedford Ave.

Brooklyn, N. Y.

Dealers, write for agency proposition.

APCO — FORD SPECIALTIES

There Are Forty of Them
FREE CATALOG

AUTO PARTS CO.

Providence, R. I.

Money

selling

Quick-Knick

We want traveling salesmen to sell QUICK KNICK to garage men and car owners. QUICK KNICK deposits a beautiful, brilliant plate of nickel on brass auto trimmings. Just out. Ground floor proposition to live salesmen.

FOREST CITY SALES CO.

DEPT. L.

FREMONT, NEB.

Annular Ball Bearings REGROUND

We carry a complete stock of reground bearings of all makes and sizes, for immediate exchange.

Get Our Prices

Ahlberg Bearing Co.

2640 Michigan Avenue

CHICAGO, ILL.

1790 Broadway

New York City

806 Woodward Ave.

Detroit, Mich.

Peerless Lamp Enamel (Gloss)

Dries in twelve hours on lamps with a high gloss finish. One coat covers solid. If a dull, drying enamel is desired, please specify. 1 gal., \$3.75; 1/2 gal., \$1.98; 1/4 gal., \$1.04; 1/8 gal., \$0.54.

Peerless Jet Black Fender Japan

A heavy bodied, high gloss finish, air drying in thirty-six hours. One coat covers solid. 1 gal., \$3.75; 1/2 gal., \$1.98; 1/4 gal., \$1.04; 1/8 gal., \$0.54.

Peerless Auto Body Polish

A brightener and restorer to the finish of all old varnished surfaces. Especially adapted for automobile bodies where the life of the varnish is worn out. 1 gal., \$3.50; 1/2 gal., \$1.85; 1/4 gal., \$0.98; 1/8 gal., \$0.51.

Peerless Cylinder Enamel

A black gloss finish not affected by grease, heat or gasoline. Keeps the engine clean. 1 gal., \$3.75; 1/2 gal., \$1.98; 1/4 gal., \$1.04; 1/8 gal., \$0.54.

Peerless Extra Fine Black Baking Japan

For brass, nickel or iron. Bakes to a high gloss, eggshell gloss or dull finish that will not crack, chip or peel. 1 gal., \$3.75; 1/2 gal., \$1.98; 1/4 gal., \$1.04; 1/8 gal., \$0.54.

Ask your dealer and jobber
or send direct to us

The Columbus Varnish Company
COLUMBUS, OHIO

CLASSIFIED ADVERTISEMENTS

The Trading Center
of the
Motor Car Industry

MOTOR AGE

Rates—25¢ per line
Minimum Charge \$1.00
6 words to a line

Cars For Sale

A BARGAIN IN RACING CARS.

One 150 H. P. French car for exhibition purposes. This car has record of 100 miles in 72 minutes and 45 seconds. One of the best money-making cars in country today. Has a full set of extra parts and two new Michelin extra tires.

One 50 H. P. special built car with complete line of extra parts for racing equipment. These cars are in perfect shape and ready for the track, but have to sacrifice them on account of other business.

C. H. King, 6128 Prairie Ave., Chicago.
Phone Normal 5303.

A FINE SEVEN-PASSENGER THOMAS flyer, beautifully equipped; in perfect condition; cost new \$6,000; will sacrifice for quick sale. Address Box D 486, c/o Motor Age.

A GOOD BUY.

Why buy used cars when for \$850.00 you can get a brand new 35 h. p. 5-passenger Continental, formerly sold at \$1,450.00?

Martindale & Millikan,
1714 Michigan Ave., Chicago.

A LATE DOUBLE "M" FORTY HORSE-power White Steamer; fine condition and fully equipped, including kerosene burner. Has not run three thousand miles. Will sell cheap. Address Box D 469, c/o Motor Age. w

AUTOMOBILES AND PARTS; LARGEST stock ever known.

Progress Brokerage Co.,
527 Grant St., Buffalo, N. Y.

FOR SALE CHEAP

One Twelve-passenger, sight-seeing car, Pullman body, in A-1 condition. Inquire of D. F. Poyer Company, Menominee, Mich.

FOR SALE—COLE 40, 1912; FULLY equipped, including seat covers, extra tire; perfect condition; will sacrifice. Address Box D 462, c/o Motor Age. n

FOR SALE—MATHESON SILENT SIX TOY tonneau touring car, 3 years old, in first-class condition. Completely equipped. Has top, windshield, Stewart speedometer, Klaxon horn, Plentje Shock Absorbers, Dorian demountable rims, 2 extra rims and tires, tire case and tire covers, trunk rack, trunk case with 2 suit cases, 2 storage batteries, electric side and tail lights, Prest-O-Lite headlights. Hartford power tire pump, extra tubes, tools, etc. Very speedy and snappy. Guaranteed in first-class condition. For sale or will exchange for standard car of larger seating capacity. Box D 489, c/o Motor Age.

FOR SALE—MODEL "M" FORTY HORSE-power White Steamer, beautifully equipped and in A1 shape. Has kerosene burner and works fine as silk. Will sacrifice. Address Box D 470, c/o Motor Age. w

FOR SALE—MODEL O-O WHITE Steamer in first-class shape; like new. T. M. Smith, 1969 Montrose Blvd., Chicago, Ill.

FOR SALE—1913 WINTON SIX; HAS been used for demonstrator. Goodyear non-skid over size tires all around. Two extra seats, one extra over size tire and tube. Will sell for \$2,500; list price \$3,725. This car has not been driven over 1,500 miles. Address Box D-492, care Motor Age.

G. J. G. — SPECIAL RACING MACHINE capable of doing better than 70 miles per hour mounted on English style of wire wheels with Bosch racing magneto and motor modeled so as to have the minimum of friction to the maximum of speed. Equipped with New any make selected of standard tire equipment. Write for Photograph and specifications to G. J. G. Motor Car Company, White Plains, N. Y.

FOR SALE—3-TON FRAYER-MILLER truck; 40 H. P., 4 cyl. water-cooled new engine, good as new. Price, \$1,500.00 f. o. b. San Benito. Address Whittlesey Garage, San Benito, Texas.

KNOX 5 PASSENGER MODEL "R" 1910 touring car. 5 new casings, car equal to new, run 7,000 miles. For quick sale will take \$1275.00. Yeggy-Don Sales Co., Rock Island, Ill.

LOZIER 1911 FOUR-CYLINDER BRIAR-cliff; A1 condition. Electric lights; good tires carried at the rear. Rocky Mountain radiator and extra large fan. Equipment complete in every detail. Removable tonneau making a fast powerful roadster. Nothing can trim you with this car. Will go anywhere as fast or as slow as you want to ride. No trades, cash only. C. L. Newcomb, Jr., 768 Franklin Street, Denver, Colo.

MITCHELLS, REBUILT, GUARANTEED. These cars are fully equipped. Call or write for further particulars.

Mitchell Automobile Co.,
2334-36-38 Michigan Ave., Chicago.



A Good Reason

"We do not care to repeat the advertisement in reference to the Knight car at this time. We sold it through the MOTOR AGE advertisement. That's why."

H. H. W.

NEVER BUY AN AUTOMOBILE UNTIL you know the material used, the good points, the objectionable parts. Send for free copy: "Foresight in Buying." Dept. K, Professional Information Association, Hartford, Conn.

SELDEN, 1912, 5 PASSENGER, FULLY equipped, demountable rims, with extra tire and rim. Up-to-date in every way. A good buy for someone wishing a good car at a low price. Condon, 2635 Wabash Ave., Chicago.

UNDERSLUNG ROADSTER, SIXTY HORSE power; four speeds; 136-inch wheel base, 40x4 1/2 tires; floating axle, imported bearings, complete with electric system; run hundred miles; worth three thousand—quick sale \$775.00. Address W. S. Reed, Martinsburg, West Virginia.

1912 DETROITER FIVE-PASSENGER touring car, in excellent condition, for \$500 cash; all tires good, Prest-O-Lite, top and complete outfit of tools. J. O. Maland, Frost, Minn.

"30-60" 5 PASSENGER STEARNS, JUST overhauled and repainted, new tires, demountable rims, with new extra tires. This is a snap for some one wishing a high-powered car at a bargain. Condon, 2635 Wabash Ave., Chicago.

1913 LOZIER 7-PASSENGER BIG SIX

with self-starter and full equipment. Car is practically brand new and has new tires all around. Price \$3,600.

ARCHAMBAULT MOTOR SALES CO.,
197 Ogden Ave., Milwaukee, Wis.

Parts and Accessories FOR SALE

A BARGAIN; STORAGE BATTERIES, 6-80 and 6-160; guaranteed; all makes, new and used, \$3.50 to \$10 for short time only. 4105-7 Cottage Grove Ave., Chicago. a

ACME REPAIR PARTS

We carry a complete stock of parts for all types of Acme cars. Can ship promptly. Adam E. Arnold, 212 S. 11th St., Reading, Pa.

A FEW FORD SPECIALTIES.

| | Reg. Price. | Our Price. |
|------------------------------|-------------|------------|
| Oil Gauges | \$1.00 | \$0.35 |
| Anti Rattling Ball Sockets.. | 2.50 | 1.25 |
| Electric Lighting Outfits, | | |
| 8-in. or 9-in..... | 9.00 | 3.50 |

Write for big summer catalogue, just out. Globe Auto Specialty Co., Dept. F., 1775 Broadway, New York.

ATTENTION—HENRY OWNERS

Having purchased the repair business of the Henry Motor Co., we are prepared to fill orders promptly for repairs for Henry cars. Muskegon Automobile Co., Muskegon, Mich.

AUTOMOBILE REPAIR AND MACHINE shops should send for our catalogue of W. B. Phosphor Bronze Bushings; 350 stock sizes listed. Wm. B. Anderson Foundry Co., 24 So. Clinton St., Chicago.

AUTOMATIC SPEEDER AND PRIMER.

Every car owner should have one. Saves 25% on gasoline, starts motor with first turn of crank. The most rapid selling automobile device on the market. Agents wanted. Price, \$7.50 f. o. b. Frankfort. Automatic Device Co., 551 E. Jefferson St., Frankfort, Ind.

A WHITE STEAMER GENERATOR AND burner, almost new. Will sell cheap. Address Box D 245, c/o Motor Age. w

AUTO OWNERS IN SMALL TOWNS.

You can save one-half your tire expense and nearly all your tire trouble by using Security Reliners. Many of our customers run their cars the entire season without blowout or puncture and without spending a cent for tire repairs.

YOU CAN DO IT YOURSELF.

If we have no dealer in your town you can get a trial order at the dealer's price, and make a good profit selling to your neighbors. If you run your own car write at once for our plan.

SECURITY RELINER CO.,

301 Spring St., Montgomery, N. Y.
248 W. 54th St., New York.

BALL & ROLLER BEARINGS,

All Types and Sizes.

We also repair or exchange all makes of ball bearings.
THE GWILLIAM CO., 253 W. 58th St., N. Y.
1314 Arch St., Philadelphia.

BARGAINS.

New Mohair Tops, complete with side and storm curtains suitable for Fords, Buicks and Flanders touring cars...\$11.85
 1 Gal. Brass Polish......40
 Gas Lamps (black and nickel), 8 1/2".....4.25
 Tail Lamps (brass).....1.00
 30x3 1/2 Inner Tubes (new).....2.25
 30x3 1/2 Inner Tubes (new).....2.75
 Electric Horns, complete.....4.00
 Terms cash with order. Money back if not satisfied.

Erwin Greer & Co.,
 1456-64 Wabash Ave., Chicago, Ill.

BARGAIN—O. B. PORTABLE AIR COMPRESSOR. Practically new; used altogether under two hours; suitable private or small public garage. Selling because discarding pneumatic tires. Box D 495, c/o Motor Age.

BARGAINS IN SPARK PLUGS, SCHEBLER carburetors, metal polish, etc. Get illustrated bulletin. Automobile Appliance Co., 1712 S. Michigan Ave., Chicago, Ill.

BERGDOLL REPAIR PARTS. The repair business of the Bergdoll cars, together with all drawings, jigs, patterns, etc., has been purchased by us. We have a complete stock of repair parts for all models on hand and orders for parts for Bergdoll cars should be placed with us direct to save time.

Louis J. Bergdoll Motor Co.,
 124 N. 3rd St., Philadelphia.

COMPLETE "VULCAN PROCESS" of oxy-acetylene welding plants from \$175 for the blacksmith and garage plant up to largest made. Torch light weight. Does not backfire in ordinary work.

Write today for our booklet on welding.
VULCAN PROCESS CO.
 25th and University Ave. S. E.,
 Minneapolis, Minn.
 Send us \$1.00 and receive illustrated cloth bound book on practical welding.

CUT-OUTS.

E.M.F., Flanders, Buick, Regal, etc. Complete outfit with brass lock open pedal, \$1.50. Lincoln Machine Shop, Lincoln, Ill.

DRAGON REPAIR PARTS.

We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

DEALERS.

It will pay you to get on our mailing list. We save you money on everything.
 Write for prices on any special needs.

The Barrier-Sawin Co.,
 State Life Bldg.,
 Indianapolis, Ind.

"FOOL PROOF."

Try the Atwater Kent system of ignition. Always works and will pay for itself in gasoline saved. Their price, \$50.00. We have 80 sets and will sell at \$18.00 each. Ask for bargain sheet. Puritan Machine Co., Detroit.

FORD FAN BELTS, WOVEN COTTON AND silk; outlasts six regular belts. Postpaid, 60c. Dealers, write. Angier's, Streator, Ill.

FORD LIGHTING OUTFITS \$5.50. Includes parabolic reflectors, tungsten bulbs, wiring switch and free delivery. Truscott Auto Supply Co., St. Joseph, Mich.

FORD OWNERS AND DEALERS!

You will save trouble and money by installing our timer elevating device.
 Ford Parts Specialty Co.,
 1211 Main St., Richmond, Ind.

FORD OWNERS—OUR SPARE DEMOUNTABLE wheel cures tire trouble on road. Doctors, attention. Write Angier's, Streator, Ill.

FORD OWNERS—WE CAN MAKE YOUR car the easiest rider made with light or heavy load; no jolts, no jars, no upthrow. Write us. Thomas Auxiliary Spring Co., Canisteo, N. Y.

FORD OWNERS: THE BLACKBURN Autolock Switch offers you Certain-Teed Theft Insurance. Yale key for plug. Price \$5.00. Money-Back Guarantee. At your dealer or Blackburn Specialty Co., 1134 Prospect Ave., Cleveland, Ohio.

FORD, HUPP AND MAXWELL Muffler cut-out, machined ready to attach, including lock open pedal string and cables, \$1.35. Lincoln Machine Shop, Lincoln, Ill. c

FORD T. OWNERS. Foot throttle or accelerators, \$1.50. Lincoln Machine Shop, Lincoln, Ill. c

FORE DOORS

AT

CUT PRICES.

To reduce stock we are offering big reductions on all our standard Fore-Doors. Write today and secure a bargain while they last.

Address Dept. A.
 Auto Specialty Manufacturing Co.,
 Indianapolis, Ind.

FOR SALE

1 60-H. P. Thomas motor, \$100
 1 35-H. P. Northway motor, \$125
 Pope-Toledo parts for sale.
 Auto Salvage Co.,
 1436 Wabash Ave., Chicago.



More Than Satisfied

"Please change our advertisement to read as per enclosed matter. Run until further notice. We have steadily secured excellent results from our ads in MOTOR AGE and are more than satisfied."
 L. D. S.

FOR SALE—VELVET AUXILIARY springs, 150 pairs; entire lot or in small quantities, while they last, at a very reasonable price. Don't miss this bargain—write quick. Stutz Motor Car Co., Desk A-2, Indianapolis, Ind.

FOR SALE—100 NEW 4-CYLINDER 5"x6" governor controlled heavy duty motors, suitable for truck or light tractor purposes. In lots to suit purchaser. Not heavy enough for our work. Must be sold at once. Will sell at a sacrifice. 570 Prior Avenue, St. Paul, Minn.

GET WRIGHT

RADIATORS FOR REPLACEMENT. Built for any car made. Prompt shipment. Get our prices.

SPECIALS THIS MONTH:
 Buick 17—\$34.00 Velle 30—\$30.00
 Hudson 20—\$32.00 Hupmobile 32—\$30.00
WRIGHT COOLER & HOOD CO.,
 8th St., Muskegon, Mich.

GOULD \$50.00 AIR COMPRESSORS FOR \$18.00. Ford outfits \$4.00 complete. Fred Allen Automobile Supply Co., 1610 S. Michigan Ave., Chicago, Ill.

GUARANTEED BATTERIES.

6 volt 140 Amperes.....\$16.00
 6 volt 80 Amperes.....13.00
 6 volt 60 Amperes.....10.00

The Ampvo Battery Co.,
 1607 Michigan Ave., Chicago, Ill.

IS YOUR FORD PROTECTED AGAINST Theft?
 Cranklock prevents theft, promotes security. Write me personally regarding this.
 H. C. Fairchild, Mfr., Maplewood, N. J.

GUARANTEED RADIATORS

For all cars. The following is our stock list of radiators for the cars mentioned, subject to immediate shipments. Compare our prices with other lists.

Ford Model "T".....\$18.00
 Buick 10-32-33-14.....27.50
 Buick F-16-17-19-26-27-28.....35.00
 Buick 38-39.....42.50
 Hudson 20.....33.00
 Chalmers F-40.....30.00
 Lion 40.....25.00
 Warren 40.....28.50
 E-M-F 30.....30.00
 Flanders 20.....30.00
 Brush A-B.....17.00
 Anhut.....15.00
 Northern C.....32.00
 Wayne 30.....35.00
 Special 40 H. P.....15.00

Terms: One-third cash with order, balance with order.

When ordering state year.

AUTO PARTS MANUFACTURING CO.,
 453 Trombly Avenue, Detroit, Mich.

KEROSENE FOR AUTOMOBILES.

Our new Model B uses successfully half and half mixture lowest grades kerosene and gasoline. Satisfaction guaranteed or money refunded. Greatly increased power; very slow speed or high. Starts easy at zero. Special agents' prices. Dept B.
 The Air-Friction Carburetor Co.,
 Dayton, Ohio.

LAMPS, BLACK AND NICKEL, \$9.50 PER pair, worth \$20.00; bodies, four-passenger, fore-door, untrimmed, \$20.00; Stapley compound foot pumps, \$2.85. Get our bulletin. Automobile Appliance Co., 1712 S. Michigan Ave., Chicago, Ill.

LANDAULET BODY.

For any Straight sill. This body is in A No. 1 condition and will prove a bargain to the first purchaser.
 Modern Autop Co.,
 607 St. Claire Ave. N. E., Cleveland, Ohio.

LION REPAIR PARTS.

We have on hand a complete stock of repair parts for all models of Lion Cars.
 Lion Motor Parts Co.,
 124 N. 3rd St., Philadelphia, Pa.

LATEST FORD ROADSTER BODY, \$35. Tops, curtains included. MacInnis Bros., Toledo, O.

MR. (FORD) OWNER AND GARAGE MAN. The Townsan Valve Adjuster has a cushion for your valve-stems. Takes away the click, absolutely silencing the valves. No screws or burrs to work loose. Saves putting in new push-rods and valve-stems. They never wear out. Price \$1.50 by mail. Ask your jobber, or address Townsan Auto Specialty Co., Mitchell, S. D.

MORA REPAIR PARTS.

We purchased the repair business of the Mora Company and have in stock repair parts for all models of Mora cars. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

MAGNETOS: WE HAVE 2,000 MODEL X Splittorf Magnets, new. Price, without coil, \$17.50 each; with coil, \$25.00 each.

The regular price of these is \$75.00. We also have other makes of magnetos at cut prices, in fact, everything for the automobile. Send for "OUR PRICE WRECKER"—the greatest money-saver in the world.

TIMES SQUARE AUTO CO.,
 1210 Michigan Blvd., Chicago, Ill.
 S. W. Cor. 56th St. & Broadway, N. Y. City.

NEW 60 H. P. 1913 CONTINENTAL, T head motor, automatic governor, \$115.00; Bosch magneto, complete, \$275.00. Rutenber 50 with clutch, \$90.00. Thomas Flyer 60 with Bosch magneto, \$125.00; same with coil, \$90.00. Monarch 35, multiple disc clutch, dual magneto, \$125.00. Winton 35, \$40.00. All 4-cyl. 4 cycle, complete.
 Weaser, 3260 Rhodes Ave., Chicago, Ill.

ONE NEW DEACO ELECTRIC LIGHTING System for sale. Cost \$125.00. Will dispose for \$65.00 cash. Address W. Smith, 3350 Calumet Avenue, Chicago, Ill.

OUR AD IN THE CLEARING HOUSE section will interest every live wire salesman. Just turn to page 104 and look it over, we know it will interest you. Look for the name QUICK-KNICK.
 Forest City Sales Co., Fremont, Nebr.

When Writing to Advertisers, Please Mention Motor Age.

"OWNERS NOTICE."

CARBON IN YOUR CYLINDERS
Will cause you more trouble than enough.
M. H. B. CARBON REMOVER
eliminates engine trouble, reduces repair bills, apply it yourself.

ACTS LIKE MAGIC.
Guaranteed to do the work or money refunded. Price \$1.00 per quart prepaid. Use 2 ounces (liquid) to one gallon of oil. Dealers, write for special proposition.
Interstate Mfg. Co., Inc.,
Walliston, Mass.

OWNERS—DEALERS.

Write for our bargain list on accessories, windshields, 34x3 1/2 tires, models J & H—K & W magnetos, axles, Ford equipment, Springs for any car manufactured in Michigan, F & S and N. D. ball bearings; in fact, everything and the automobile.

NOTICE, GARAGE OWNERS.
Write us for our special bargain list on machinery and tools.
AUTOMOBILE SUPPLY & MACHINE CO.,
718 Free Press Bldg. Detroit, Mich.

OXY-ACETYLENE WELDING AND CUTTING MACHINE. The Admiral Welding Machine is built by men who know; large capacity; self-generating; portable; perfect for all classes of work. Send for booklet, "Welding and Cutting." Price, with Welding and Cutting Torches, all Filler Rods, Fluxes, Chemicals, etc., ready to begin earning big money, \$250.

We do expert welding; prices right.
Admiral Welding Machine Co.,
1331 Walnut St., Kansas City, Mo.

RADIATORS

To order for all cars.
We use copper fins and tubes.
You can buy brass cheaper, but the cooling efficiency is not there.

Black enamel, baked finish, \$2.00 extra.
Terms cash with order, or one-third deposit with C. O. D. shipments.
\$5.00 Trade Allowance for old radiator shipped in F. O. B. Detroit.

| | |
|----------------------------------|---------|
| Ford Model T..... | \$22.00 |
| Ford Model R, S & N..... | 28.00 |
| Hupmobile 1910-1911..... | 28.00 |
| Hupmobile 1912-13..... | 38.00 |
| Warren 1910-1911-1912..... | 35.00 |
| Packards to sample, \$50 to..... | 65.00 |
| E. M. F. 30..... | 35.00 |
| Flanders 20..... | 30.00 |
| Patterson 30..... | 35.00 |
| Buick 10-14-32-33..... | 30.00 |
| Buick 16-17-19-26-27-28..... | 35.00 |
| Hudson 20..... | 32.00 |
| Hudson 33..... | 40.00 |
| Cadillac 30..... | 35.00 |
| Paige 1910-1911..... | 28.00 |
| Paige 1912..... | 30.00 |

SPECIALS.

| | |
|---|--------|
| One pair Solar eclipse headlights..... | 35.00 |
| Gabriel horns, 1, 2 and 3 tubes, \$5, \$7.50..... | 10.00 |
| Lion 40 Racing roadster model..... | 700.00 |
| Bullet electric lamps, per pair..... | 10.00 |
| Prest-O-Lite tank, small..... | 9.00 |
| Prest-O-Lite tank, large..... | 12.00 |
| Leather runningboard trunks, with two suitcases to fit, bargain..... | 15.00 |
| 17-inch rubber covered steering wheel..... | 2.00 |
| Nonpareil horn bulbs..... | 35 |
| HURON RADIATOR & LAMP COMPANY, 253-255 Jefferson Ave., Detroit, Mich. | |

PANEL AND TRUCK BODIES

of special design particularly for the economical handling of merchandise. Ornamental bodies of exclusive style built to order; good and high-class painting. Get our estimates.

Fargo Motor Car Co.,
1164 W. 22d St., Chicago.

RADIATORS—NEW GUARANTEED GOODS

| | |
|-----------------------|------|
| Ford, Model T..... | \$14 |
| Buick Model 10..... | 22 |
| Buick Model F..... | 25 |
| Chalmers-Detroit..... | 20 |
| Beverett..... | 20 |
| Stoddard-Dayton..... | 35 |

Any other make required at equally low prices.

Times Square Automobile Co.,
1210-1212 Michigan Ave., Chicago.

"SAVE YOUR GASOLINE."

We have 150 Rayfield carburetors, regular \$20.00 kind. Our price, \$8.20 while they last.
PURITAN MACHINE CO.,
415 Lafayette Blvd., Detroit, Mich.

SCHUBLER MODEL "L" CARBURETORS,
new, 1 1/4 or 1 1/2-inch, \$8.00 each. Order early. Kent Motor Car Co., Kenosha, Wis.

REAL BARGAINS IN MOTORS

Unit power plants, radiators for all standard makes of cars. Windshields \$7. Side oil lamps, brass or black, \$2.75 pair. Gas or electric head lights, 3 1/2 to 9 inches, \$6 per pair. \$1 spark plugs 20c. Universal joints, steering gears and other parts for cars at bargain prices. Write today to

Nichols Company

424 Grand River Ave.,
Detroit, Mich.

SEAT COVERS FOR ALL CARS—SPECIAL
price on Fords. We clean old covers; make them look like new. Auto Cape Top Co., 2334 Michigan Ave., Chicago.

SEND FOR

OUR NO. 750 BARGAIN SHEET.
AUTO PARTS CO.,
513-31 W. JACKSON BLVD.,
CHICAGO, ILL.

SPECIAL NOTICE

THE ONLY PLACE TO BUY AUTOMOBILE SUPPLIES RIGHT.
WE GUARANTEE TO SAVE YOU FROM 25% TO 50% ON SUPPLIES AND TIRES.

SEND FOR OUR BARGAIN SHEET.

CUT PRICE AUTO SUPPLY STORE,
438 RUSH ST.,
CHICAGO.

TOURING, ROADSTER, RACING BODIES,
Seats, special and stock sizes. Radiators, hoods, tanks and fenders for any car. Get our prices.

Auto Sheet Metal Works,
1534 Michigan Ave., Chicago.

TOPS BUILT, RECOVERED AND REPAIRED.

C. G. Meyer & Son, Tiffin, Ohio.

TRUFFAULT—HARTFORD SHOCK ABSORBERS; \$45.00 kind; \$20.00 set of four.
PURITAN MACHINE CO.,
417 Lafayette Blvd., Detroit, Mich.

TWO 34x4 BRITSON TIRE TREADS FOR
sale cheap. Only been used a couple of hundred miles. Good as new. C. R. Lundell, Kiron, Ia.

UNION OXY CARBIDE CO.

Manufacturers of Portable (weight 40 lbs.) and stationary welding, cutting or lighting plants; supplies of all kinds. Agents wanted.
Fulton & Enfield Sts., Brooklyn, N. Y.

WE NOW HAVE BUT A FEW 30-35 AND 35-40 H. P. motors ready for shipment. Complete with magneto, coil and clutch. F. E. Alford, Goshen, Ind.

WESTON MOTT HIGH GRADE REAR
axles, \$45.00. Other bargains, too.
PURITAN MACHINE CO.,
413 Lafayette Blvd., Detroit, Mich.

WRITE THE GUN METAL FINISH CO.,
313 Powers Bldg., Decatur, Ill., for free samples of **ELECTRO-KNICKEL POWDER**, for plating automobile trimmings. Will put on as heavy a coat of metal as an electroplating bath.

5/2x5 TWO-CYLINDER DAVIS TRUCK
motor with magneto coil and carburetor, practically new, \$200.00. Power Equipment Co., Minneapolis, Minn.

50 NEW PRESSED STEEL FRAMES 103"
long, 34" wide. Each \$10.00. Send for sketch.

Lucas & Son, Bridgeport, Conn.

Cars Wanted

CAR WANTED—I OWN 100 ACRES OF
timber and mineral land in Mo. worth \$1,500 that I will trade for new touring car of '13 or '14 model of equal value. I want a car and will give a good trade if you have the car I want. B. F. Gollmar, Baraboo, Wis.

FOR SALE OR TRADE—OKLAHOMA
farm for a car. 160 acres nice level land, best of soil, all fenced and comfortable house in a good farming country. No incumbrance and title good at \$20.00 per acre. No less. Will take a car as part payment if in good running order and priced right. Don't write, but come and see. Reference, the Bank of Texline. A. L. Stone, Texline, Tex.

TO TRADE FOR AN UP-TO-DATE
roadster, my equity in a smooth, level, improved 160-acre farm, five miles from this town. A. F. Dankenbring, Eagle Butte, South Dakota.

For Sale or Exchange**FOR SALE OR TRADE**

A one-ton Buick truck. \$700, if taken at once.

A large 1910 5 passenger 40 H. P. Mitchell, detachable tonneau, 4-inch tires; will make fine truck and pleasure car combined, \$450.
Albany Automobile Co.,
Albany, Wis.

Parts and Accessories WANTED

WANTED—PREST-O-LITE TANKS. WE
pay the following prices:

| | |
|---|--------|
| A. Presto Tanks (large)..... | \$9.00 |
| B. Presto Tanks (medium)..... | 7.50 |
| C. Presto Tanks (small)..... | 6.00 |
| Ship in any quantity C. O. D. or S. D. B. L. | |
| ERWIN GREER & COMPANY, 1456-64 Wabash Ave., Chicago, Ill. | |

Situations Wanted

AUTOMOBILE ENGINEER WITH EIGHT
years' designing and 12 years' shop experience with exceptional mechanical, inventive and executive ability, seeks a situation in production or engineering. Write Box D 477, c/o Motor Age.

AUTOMOBILE MECHANIC OF 7 YEARS'
actual service desires a position with automobile or gasoline engine company for services in South America or Southwest part of U. S. Address Box D 472, c/o Motor Age. 1

EUROPE.

I want to connect with some good, square firm as European manager and a percent on profits. I have 12 years' experience with automobiles as practical and technical man. Am a real live salesman, organizer, manager and a tireless hustler. I can speak English, French and German. I have successfully established a German car on the English market, selling at a high figure against very keen competition. I can do the same for you. Don't go in for agencies, but establish yourselves right here on the spot and keep all the profits. Your own show in Europe is the right tack to be on. See what the Ford and Studebaker have done, and are doing, here, but, mind you, with their own branch. I can sell your goods in France, Germany and all other countries, for I know all about their ways. I am available on September 1st this year, owing to disagreement with my partners. Write quick. A. S., 4 Blandford Road, Bedford Park, London, W.

EXPERIENCED YOUNG MAN WHO IS
first-class salesman desires position in salesroom or garage. Am also an expert stenographer and office man and could help with this work. Capable of taking complete management of small business. Employed at present. Address Box D 493, c/o Motor Age.

FORD REPAIRMAN AND DEMONSTRATOR, one who knows the business thoroughly, wishes to make change. Also experienced on practically all cars. Married. References. Address Box D, 488, c/o Motor Age.

POSITION WANTED AS SALESMAN OR
demonstrator by reliable young man having four years' experience. Can give bond and furnish references. Address Box D 467, c/o Motor Age. b

POSITION WANTED BY AN EXPERIENCED
mechanic and driver, with some northern owner of a high-grade automobile, as chauffeur during the summer and fall; absolutely sober and reliable; for further particulars address Box D 447, c/o Motor Age. r

SALES MANAGER.

Real salesman with broad and successful retail and factory experience as sales and advertising manager desires position with progressive concern. Best of references. Address Box D 494, c/o Motor Age.

WANTED—A POSITION AS ASSISTANT manager in garage; have had 12 years' experience; best of references. Address Box D 475, c/o Motor Age.

WANTED—POSITION WITH SOME AUTO firm year around by expert mechanic; also specially good on carburetor coils and magnetos. Would consider job as demonstrator. F. A. Harvey, Tracy, Iowa.

Help Wanted

ENGINEERS, SUPERINTENDENTS, Works Managers, Designers, Production and Efficiency Engineers, and Draftsmen with automobile experience. Inquiries confidential; record must stand investigation when desired. The Engineering Agency, Inc.—20th Year—Chicago.

TIRE MAN WHO IS COMPETENT AND reliable. State reference, salary wanted, etc. Act quick.

Lahr Motor Sales Co., Bismarck, N. D.

WANT DRAFTSMEN EXPERIENCED IN detail work. Please state experience, age and wages desired. Moline Automobile Company, East Moline, Ill.

WANTED

A first-class mechanic for all makes of cars. Prefer a factory tester and a married man, but not essential. No "boozers." State salary and reference. Permanent position to right man.

Gage Auto Co., Minneapolis, Kansas.

WANTED—AN AUTOMOBILE SERVICE Manager competent to assume entire charge of all road work of the service department, including the employing and supervising of the work of service men under him.

Address Palmer & Singer Mfg. Co., Long Island City, N. Y., or Western Branch, 2638 Michigan Ave., Chicago, Ill.

WANTED—THOROUGH AND EXPERIENCED factory superintendent for assembly proposition. Must be familiar with body painting and trimming. Address, giving full particulars, references and details. Address Box D 473, c/o Motor Age.

60 HIGH GRADE MEN WANTED

For all lines of the automobile industry. The Toledo Engineering Agency, Toledo, O. H. L. Croy, M. E., Mgr. Member S. A. E.

Business Opportunities

CONTROLLING INTEREST IN TAXICAB business in prosperous city of 50,000 may be purchased at a reasonable price; half down, balance on time. Owner has other business interests. For full particulars, address Box D 474, c/o Motor Age.

FOR SALE—A GARAGE 50x116 FEET IN town of 2,000; only garage in town; 2 car agencies; sold 45 cars so far this season; good machine shop and large accessory line; takes about \$12,000 to handle business. Owners have other business that requires their time. Address Lemmon Auto Co., Lemmon, S. Dak.

FOR SALE—GARAGE, LIVERY AND REPAIR shop; new R. R. \$2,500 takes it with two cars. Center Garage, Center, Colo.

FOR SALE—AUTOMOBILE TIRE AND supply store doing thriving business in N. W. city; no competition. For particulars address Box D 484, c/o Motor Age.

FOR SALE—IN NORTHERN ILL., GOOD equipped auto and tire repair shop; fine location, plenty of work, lots of cars and an A1 place for a good repairman. Reason for selling, wish to go west. For full particulars address Box D 452, c/o Motor Age.

MUST SELL HALF INTEREST

In patents and profits of a successful automatic tire pump, manufactured and financed by responsible corporation. An excellent opportunity for good returns on a small investment. Address Box D 487, c/o Motor Age.

PROMOTER WHO CAN PLACE THE best transmission ever invented. All drives direct. Simple, compact, strong, efficient, durable gears, always in mesh, less number of gears, 4 speeds forward and reverse, only 9 gears; 5 forward and reverse only 11 gears. Patented in U. S. A. and in foreign countries. If you are a live wire write for full particulars. G. S. & B., R. R. No. 5, Perry, Okla.

PARTNER WANTED

with about \$3,000 to increase manufacturing facilities on an automobile necessity having been marketed for twelve years. Address Box D 491, c/o Motor Age.

RECEIVER'S PUBLIC SALE.

By order of the Court, the valuable plant, machinery, tools and stock on hand of the Grout Automobile Co., Orange, Franklin County, Mass., will be sold to the highest bidder on Thursday, September 4, at 2 o'clock p. m., on the premises.

The real estate consists of the well known Grout factory, built of brick, stone trimmings, one of the best built sets of buildings to be found in the state for manufacturing purposes, built for the carrying of heavy machinery, well lighted, equipped with 75 horsepower Dillon boiler, 50-horsepower Brown engine, also equipped with electric power, separate heater for paint, department can be used when desired; first building two stories, main building three stories; 38,000 square feet of floor space, fully equipped with shafting machinery, pulleys, belting, elevator for handling cars and merchandise; two store houses besides brick store house for storing oil; two gasoline tanks holding 600 gallons, connected with pump in building; two-story two-tenement house, modern; 15 acres of land; doing a repair business of easily \$30,000 a year, which can be increased. The factory is located on East Main St., the main thoroughfare for automobiles between Boston and the west, making it one of the most desirable propositions ever offered at public sale for parties desiring to engage in either manufacturing and repairing of automobiles or repairing and selling of automobiles, or, in fact, any business requiring a substantial building for manufacturing of any kind.

The plant will be open for inspection from August 9 to date of sale.

Send for catalogue.

RUFUS T. SHUMWAY, Receiver,
Orange, Mass.

TO CLOSE AN ESTATE WILL SACRIFICE 1912 Marion Roadster, center control, guaranteed A No. 1 condition. Trenton House Garage, Trenton, N. J.

Tires

DON'T READ THIS

Unless you are interested in the purchase of new and slightly used tires at special prices.

A splendid line of lamps at prices that will interest you.

Monarch Tire & Repair Co.,
1151 Wabash Ave., Chicago. Phone Har. 1440.

ENGLEBERT TYRES.

Made in Belgium.
Standard in all sizes. Guaranteed 4,000 miles.
New and Second-Hand Tires at a Great Reduction.

Send for Circular on Repair Work.

Colonial Rubber Works,
46-52 E. 28th St., Chicago.

NON-SKID TIRES.

All standard makes at the following prices:

| Size | Price | Size | Price |
|----------|---------|----------|---------|
| 30x3 1/2 | \$14.50 | 34x4 1/2 | \$27.00 |
| 32x3 1/2 | 16.00 | 35x4 1/2 | 28.00 |
| 32x4 | 20.00 | 36x4 1/2 | 29.00 |
| 34x4 | 22.50 | 36x5 | 31.50 |
| 36x4 | 24.50 | 37x5 | 32.50 |

I do not carry any but standard make tires or deal in inferior brands. I will ship any size tire listed above to any part of the U. S. upon receipt of 10% of order, balance C. O. D.

M. C. MORAN,
334 Amsterdam Ave., New York City.

TIRES—NEW AND USED—TUBES

All standard makes. Call or send for price list. Repairing by experts.
Acme Tire & Repair Co., 842 W. Jackson Blvd., Chicago. Phone Monroe 2400.

REO AND BUICK OWNERS.

Well known make of new factory second tires in two sizes only, 34x3 1/2 Q. D. clincher or regular clincher, smooth, at \$9.50 each. 30x3 1/2 Dunlop or straight side, smooth, \$8.25 each. Will furnish Goodyear rings at \$.75 each with tire order. Ten per cent with order, balance C. O. D., subject to inspection. Kastner Tire & Rim Co., 2112 Michigan Ave., Chicago, Ill.

TIRES.

New and Slightly Used Tires Far above the average. Our success has demonstrated that our goods are right and a trial will convince you. Send for circular NOW.
Serlin Tire Co.,
1073 14th Pl., Chicago.

TIRES. TIRES.

I will sell you good wrapped tread clincher tires cheaper than any one in the United States. New 1913 stock. 34x4 Case, \$14., all other prices accordingly. Write for prices.
D. Ogden,
Columbus, Ind.

Magnetos

MAGNETOS

Repaired, remagnetized; prompt service on all makes.

Get our exchange proposition on new K-W for old equipment.

Spark Coil, Storage Battery and Carburetor Repairs.

Northwestern Distributors.

K-W magnetos, Schebler carburetors, Vesta lighting equipments.

Kellogg Self Starters and Tire Inflators.
Reinhard Brothers Co.,
Minneapolis, Minn.

Portable Garages

CHICAGO PORTABLE GARAGE CO., Makers of the "better kind" of portable garages at popular prices.

They are simple to erect, are durable, and possess a style of exclusiveness.

Full particulars concerning material, sizes and prices mailed for the asking. Why not write now?

812 Sacramento Blvd.,
Chicago, Ill.

GOOD PRIVATE AUTO GARAGES \$58 up, 14 sizes; wood and steel; well built and sold at honest prices. Write before you buy. J. A. Catherman, Beaver Springs, Pa.

PINYOUN'S PORTABLE GARAGES.

Built to last.

These are not light, flimsy structures, but solid, substantial, stylish garages that are guaranteed to give years of service & satisfaction. Descriptive literature for the asking.

F. C. Pinyoun & Son,
2530 Carnegie Ave., Cleveland, Ohio.

Rebuilding and Repairing

AUTOMOBILE CYLINDERS REGROUND, new pistons and rings fitted. Garage Air Compressors. Cast Iron Brazing Co., Manchester, N. H.

AUTOMOBILE REPAIRING OF THE highest class at prices that are fair to both parties has made possible our reputation for reliability. Estimates cheerfully furnished. Barrett Automobile Repair, 150 E. Indiana St., Chicago. Phones: North 7511, Automatic 43-482.

CYLINDERS REGROUND AND FITTED with new pistons and rings for \$7 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices. The Crown Machine Shop, Crown Point, Ind.

CYLINDERS REGROUND

and fitted with new pistons and rings for \$15 per cylinder. We make parts and cut gears of all kinds. Send us your old parts and we will repair or duplicate them in record time. Cracked cylinders, gear cases, etc., welded and made good as new. Aluminum, bronze and brass castings of every description. The Adapt Machinery Co., 1624 Wabash Ave., Chicago, Ill.

CYLINDERS REGROUND, NEW PISTONS

and rings fitted, gear cutting, of all kinds and materials, transmission and bevel gears, piston pins and push rods of chrome nickel steel, hardened, tempered and ground; guaranteed better than factory; old piston pins reground and fitted to your new pistons; old push rods reground and furnished with new guides, crank shafts, connecting rods, valves, crank cases, any part for your auto or motor; reproduced same as original but better; phosphor bronze bushings carried in stock. Send old or broken parts to go by. The shop of quality.

McCadden Machine Works,
St. Cloud, Minn.

DIFFICULT REPAIRING.

Auto parts duplicated for any make of car. Wrecked cars and trucks rebuilt. Send the broken parts to us if the maker of your car cannot duplicate promptly.

Fargo Motor Car Co.,
1164 W. 22d St., Chicago.

THE FIXIT WINDSHIELD CO.

Expert repairers and reglazing of all kinds. All work guaranteed. A trial will convince you. 1919 S. Wabash Ave., Chicago.
Phone Calumet 4583.

Auto Tire Repairing

EXPERT VULCANIZING GUARANTEED.
Our low prices and quick deliveries have made us famous. Ask for our list of used tires.

Reinsberg Auto Tire & Supply Co.,
1239 Michigan Ave., Chicago.

Radiator and Lamp Repairing

A-A-A RADIATORS MANUFACTURED and repaired. Radiators of any make repaired and returned same day. We can make any style radiator and ship in three days.

Sheppard Co.,
1331 Jackson Blvd., Chicago.

AA1 AUTO LAMP REPAIRING.

All Radiators Repaired by expert workmen.
All work guaranteed by the
Michaud Metal Works, 1615 Wabash Ave.,
Chicago. Tel. Cal. 5286; Auto 67-337.

ALL KINDS OF AUTO RADIATORS, hoods, fenders, lamps and windshields, etc., rebuilt and repaired. All work guaranteed. Also general sheet metal works. Phone or mail order. L. Blumenfeld & Co., 1919 Wabash Ave., Chicago. Tel. Cal. 4583.

ARROW RADIATOR REPAIR CO.,

1331 Wabash Ave., Chicago.
Expert repair work on Radiators, Hoods, Fenders, Dashes, Tanks and Drip Pans. We guarantee all our work. Phone Cal. 1995.

CHICAGO MANUFACTURING COMPANY,

1466 Michigan Avenue, Chicago.
We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

ILLINOIS AUTO SHEET METAL WORKS, 58-60 E. 16th St., Chicago, Ill. Manufacturers and repairers of Radiators, Hoods, Fenders, Tanks, etc. Cores built in old radiators. We do expert repairing, at lowest price. Calumet 1191.

ONLY RADIATOR FACTORY IN NORTH-west. Eleven years' knowing how. Why send your Radiator down East when you can ship it to us; save Time, Express, Freight, Money, and get best workmanship. Prices right. Make new Radiators; allow for old one.

Todd Manufacturing Co.,
820-822-824 Mary Pl., Minneapolis, Minn.

THE M. & L. AUTO SHEET METAL Works rebuild and repair radiators, hoods, fenders, tanks, lamps, etc.
1551 Michigan Ave., Chicago, Ill.
Tel. Cal. 2348.

Welding

AMERICAN WELDING CO.,

2637 Michigan Ave., Chicago.
Autogenous welding of all metals, such as crankcases, cylinders, etc. We positively guarantee all work. Tel. Calumet 3563.

AUSTIN WELDING CO.

Welders of all metals. Aluminum cases a specialty.
6753 S. Halsted St. Chicago, Ill.

BRAZING AND WELDING CO.

of Chicago.
All metals brazed and welded are guaranteed. Experts in aluminum welding. Send for circular on aluminum welding. 1615 Wabash Ave. Tel. Calumet 5286.

BROKEN CRANKSHAFTS, CRANKCASES, cylinders, flywheels, gear teeth, pistons perfectly welded and machined, ready to replace. Scored cylinders made new. Booklet, Atlas Welding Works, Rahway, N. J.

THE WELDING COMPANY

Springfield - Boston - Hartford - Holyoke - Bridgeport. Aluminum cases and cast iron cylinders a specialty. Five shops with five years' successful experience.
Ask for our printed guarantee.

WELDING—CYLINDER CRANKCASE AND Crankshaft Welded. Cylinders rebored, \$7.00 to \$11.00 a cylinder, including piston, 8 rings. Sterling Engine Company, 331-333 S. Clinton St., Chicago, Ill.

WELDING

Cast iron, aluminum and all metals.
National Welding & Mfg. Co., Inc.,
523 Jackson Blvd., Chicago, Ill.

WE WELD AND ABSOLUTELY

Guarantee
our welds to hold, cylinders (cracked in or outside), crankshafts, aluminum crankcases, transmission cases, housings, etc., by the Oxweld process of welding and cutting metals.
Estimates furnished for job or repair welding and cutting operations of all kinds. Oxweld Acetylene Co., 37th St. and Jasper Pl., Chicago, Ill. Downtown receiving station, 557-561 W. Jackson Blvd.

Patent Attorneys

ATTENTION—PATENT YOUR INVEN-tion. Free search and opinion. Send for inventor's Primer free. Milo B. Stevens & Co., 312 S. Dearborn St., Chicago. Established 1864. Main office, Washington.

C. L. PARKER, PATENT ATTORNEY, Formerly member Examining Corps, U. S. Patent Office, 960 G St., Washington, D. C. Pamphlet of instruction sent upon request.

Automobile Schools

AA1 IS HOW OUR STUDENTS STAND with auto owners. Our school is the oldest, best equipped, most practical and successful in America. Write, phone or call for particulars. Auto School of America, Dept. M, 1600 Mich. Ave., Chicago. Tel. 1088 Cal.

ACADEMY OF AUTOMOBILE ENGINEER-ing—\$35 pays for complete unlimited course on automobiles. Actual repair work and road lessons daily. Best equipped school and shop in Chicago. Evening classes also. Call or write, 1454 S. Michigan Ave., Chicago.

BE AN AUTO MACHINIST

There's a big demand for automobile machinists and for men to do repair work in garages. Pay is good. Automobile Machinists' Course—In 48 weeks we teach you all about automobiles and make you a machinist. Chauffeurs' Course—in 12 weeks we teach you to drive and repair any car and to take charge of garage.

HIGHLAND PARK COLLEGE has the largest garage and machine shops in the country. Students work in shops from three to eight hours a day. Tuition and living expenses remarkably low. No entrance examinations. Send for catalogue. George P. Magill, President, Des Moines, Ia.

GREER COLLEGE OF MOTORING Opposite Coliseum, 1459 Wabash Ave., Chicago. A practical education; 100 automobiles, 2 entire floors, 8 instructors; day and evening classes. Free booklet. Phone Calumet 327.

RELIABLE AUTOMOBILE SCHOOL.

If you only want to learn to drive a car or to take a car to pieces or to clean up dirty parts, don't come to my school. But if you want to learn the Automobile Construction in all its phases thoroughly, then come to the Reliable School.
THE F. E. EDWARDS' AUTOMOBILE SCHOOL,
1427 Wabash Ave., Chicago.

Automobile Books and Maps for Motorists

A. L. DYKE'S AUTO INSTRUCTION—A new idea of instructing you to run and repair automobiles at home with working models (from London), charts, etc. Indorsed by Duryea, Oldfield, Splittorf. Send for free 32-page illustrated and interesting book. A. L. Dyke, Box 16, Roe Bldg., St. Louis, Mo.

GAS ENGINE TROUBLES AND INSTAL-lation. Cloth, \$1.00; flexible leather, \$1.50. Automobile Troubles and How to Remedy Them. Cloth, \$1.00; leather, \$1.50. Ten other practical and reliable mechanical books. Send for circular.

Charles C. Thompson Co.,
1128 S. Wabash Ave., Chicago.

NEW MICHIGAN ROAD MAP (LOWER peninsula). All the roads, lakes and streams. Price \$1. John F. Nellist, 1955 Jefferson Ave., Grand Rapids, Mich.

PARTS AND ACCESSORY MAKERS.

The motorcycle field is well worth your attention; 75,000 new machines in 1912. Leading medium. Motorcycle Illustrated, 51 Chambers St., New York City. Paid circulation over 8,600.

THE GAS ENGINE HANDBOOK, BY E. W. Roberts; 7th edition, entirely rewritten; 316 pages, 4 1/2 x 7 1/2, limp leather, pocket size. Complete formulas for design of automobile and marine motors, gas engines, etc. Price \$2, postpaid. Circular and copy of The Gas Engine Magazine free. The Gas Engine Publishing Co., 203 E. 7th St., Cincinnati, O.

Mailing Lists

AUTOMOBILE MAILING LISTS.

| | |
|---------------------------------|---------|
| 13,191 Automobile Dealers | \$25.00 |
| 9,627 " Garages | 20.00 |
| 5,681 " Repairs | 12.50 |
| 3,541 " Supplies | 10.00 |

Neatly typewritten, showing Financial Rating in dollars of each one, alphabetically by States and Towns, 1913 compilation.

Ask for certain States if you do not want all.

877,000 Automobile Owners, by States, Price on application.

Ask for our "Silent Salesman," showing 2,000 other lists, etc.
Send check with order.

TRADE CIRCULAR ADDRESSING CO.,

166 West Adams Street,
CHICAGO.
Established 1880. Phone Franklin 1183.

AUTOMOBILE ADDRESSING AND MAIL-ing lists; card systems; any section, any make. Auto List & Addressing Co., Buick Bldg., New York City, N. Y.

AUTOMOBILE LISTS OF OWNERS, DEAL-ers, etc.; any state. Auto Directories Co., 1717 Broadway, New York City.

NEW ENGLAND AUTO LIST AND TOUR-ist includes weekly lists of all N. E. Auto Owners, Garages, Dealers, etc., with maps. Selected N. E. routes and motor news, \$10.00 yearly. 138 Pearl St., Boston, Mass.

Hotels

HOTEL WYCHMERE, EUROPEAN, Indiana Ave. and Eighteenth St., Chicago, in the very center of the automobile district; 75c to \$1.50 per day; with bath, \$1.00 to \$2.00. Clean, comfortable rooms. Fine 40c table d'hôte. Take South Side trolley to door.

HECO COILS

FOR MODEL T FORD CARS



HECO COILS were adopted by the FORD COMPANY for their model T cars because it was proved by tests that these coils would operate the light, high speed motor of the Ford up to its full capacity.

The HECO COIL insures perfect synchronism with the fly wheel magneto. It provides a larger, hotter spark than others because its core is made of iron wire of proper gauge, while the secondary is wound with the best grade of silk covered wire. Everything about HECO COILS—their design, their construction, and the material used in them, points to the highest efficiency.

Motorists, our exchange offer is worth your attention. If you are not using the HECO COIL on your model T Ford car now, send us your old coil with \$15 and we will forward you one of our famous HECO COILS. This means that your old coil is worth \$23 toward the purchase of a new HECO.

HEINZE ELECTRIC COMPANY
Factories & General Office, Lowell, Mass.
Sales Office, Detroit, Mich.



We will not build a radiator in our factory that is not honestly and scientifically designed to do the work required of it. Our continued business relationship with the makers of America's best cars, year after year, offers abundant testimony of the soundness of this policy.

The Mayo Radiator Co.
New Haven, Conn.

Index to Advertisements

| | |
|---|--|
| A | Electrical Specialties Mfg. Co. 102 |
| Abbott Motor Co. 74 | Empire China Works. 87 |
| Ajax-Grieb Rubber Co. 102 | |
| Alma Motor Truck Co. 55 | F |
| American Ball Bearing Co. 62 | F. I. A. T. 97 |
| American Electric Co. 91 | Ford Motor Co. 92 |
| Ames Motor Car Co. 97 | |
| Atwater-Kent Mfg. Works. 87 | G |
| Auburn Automobile Co. 99 | Gabriel Horn Mfg. Co. 85 |
| Automobile Blue Book Pub. Co. 83 | Gallagher Carburetor Co. 79 |
| Automobile Supply Mfg. Co. 92 | Gilbert Mfg. Co. 91 |
| B | Gilmer, G. Walker, Jr. 100 |
| Badger Brass Mfg. Co. 101 | Golde-Patent Mfg. Co. 91 |
| Bailey Electric Co. 53 | Goodyear Tire & Rubber Co. 90 |
| Baker Motor Vehicle Co. 64 | Gould Storage Battery Co. 82 |
| Barthel & Daly. 98 | Gray & Davis. 4 |
| Bartholomew Co. 76 | Grossman, Emil, & Co. 100 |
| Beaver Mfg. Co. 100 | Guide Motor Lamp Mfg. Co. 86 |
| Beckley-Ralston Co. 103 | |
| Benton, L. F., Co. 91 | H |
| Billings & Spencer Co. 82 | Halliwel Co. 93 |
| Borland-Grannis Co. 96 | Hartford Suspension Co. 2 |
| Bosch Magneto Co. 3 | Havers Motor Car Co. 65 to 68 |
| Braender Rubber & Tire Co. 101 | Hayes Mfg. Co. 91 |
| Brennan Motor Mfg. Co. 88 | Haywood Tire & Equipment Co. 102 |
| Bricton Mfg. Co. 99 | Hazard Motor Mfg. Co. 93 |
| Bridgeport Brass Co. 96 | Heinze Electric Co. 110 |
| Briggs-Detroit Co. 98 | Henderson Motor Car Co. 91 |
| Brown Co. 61 | Herreshoff Motor Co. 93 |
| Brown Commercial Car Co. 63 | Herz & Co. 76 |
| Buckeye Mfg. Co. 90 | Hess Spring & Axle Co. 101 |
| Buda Co. Cover | Hollenden Hotel Co. 88 |
| Buob & Scheu. 103 | Holley Bros. Co. 51 |
| Byrne-Kingston & Co. 60 | Holtzer-Cabot Electric Co. 89 |
| C | Hotel La Salle. 84 |
| Cartercar Co. 99 | Hotel McAlpin. 83 |
| Central Brass & Fixture Co. 80 | Hotel Woodstock. 97 |
| Chadwick & Trefethen. 103 | Houk, Geo. W., Co. 94 |
| Chase Motor Truck Co. 100 | Hoyt Electrical Instrument Works. 103 |
| Chicago Automobile Supply House. 103 | Hudson Export & Import Co. 54 |
| Classified. 105 to 109 | Hupp Motor Car Co. 98 |
| Class Journal Co. 72b | Hyatt Roller Bearing Co. 73 |
| Cleveland-Canton Spring Co. 95 | |
| Cole Motor Car Co. 92 | I |
| Connecticut Telephone & Electric Co. 90 | Ideal Steel Wheel Co. 97 |
| Continental Motor Mfg. Co. 91 | Ingersoll-Rand Co. 101 |
| Corbin Screw Corporation. 111 | Inter-State Automobile Co. 96 |
| Corcoran Lamp Co. 98 | Invader Oil Co. 58-59 |
| Covert Motor Vehicle Co. 101 | |
| Cullman Wheel Co. 103 | J |
| D | Jenkins Mfg. Co. 98 |
| Dean Electric Co. 98 | Jiffy Auto Curtain Co. 69 |
| De Soto Motor Car Co. 90 | Johns-Manville, H. W., Co. 97 |
| Detroit & Cleveland Navigation Co. 90-95 | Jones Electric Starter Co. 97 |
| Diamond Rubber Co. of New York. 90 | Jones Speedometer Co. 92 |
| Dixon, Joseph, Crucible Co. 97 | |
| Dorris Motor Car Co. 99 | K |
| Double Fabric Tire Co. 88 | K-W Ignition Co. Cover |
| E | Keeton Motor Co. 92 |
| Eagle Oil & Supply Co. 85 | Kellogg Mfg. Co. 88 |
| Eisemann Magneto Co. 96 | Kelly Springfield. Back Cover |
| | Kimball Tire Case Co. 100 |

Index to Advertisements

| | | | |
|--------------------------|----|----------------------------|----|
| Kinsey Mfg. Co..... | 99 | Regal Motor Car Co..... | 48 |
| Kissel Motor Car Co..... | 91 | Remy Electric Co..... | 87 |
| Knox Automobile Co..... | 84 | Republic Rubber Co..... | 99 |
| | | Rhineland Machine Works Co | 96 |
| | | Royal Equipment Co..... | 93 |
| | | Rutenber Motor Co..... | 97 |

L

| | |
|------------------------------|----|
| Lovell-McConnell Mfg. Co.... | 47 |
| Lozier Motor Co..... | 95 |

S

| | |
|-------------------------------|-----|
| Schoen-Jackson Co. | 103 |
| Schrader's, A., Sons..... | 103 |
| Searchlight Gas Co..... | 93 |
| Selden Truck Sales Co..... | 78 |
| Shaler, C. A., Co..... | 77 |
| Sheldon Axle Co..... | 95 |
| Sparks-Withington Co. | 101 |
| Speedwell Motor Car Co..... | 71 |
| Spicer Mfg. Co..... | 94 |
| Splitdorf Electrical Co..... | 100 |
| Spring Leaf Lubricator Co... | 89 |
| Standard, The, Co..... | 93 |
| Standard Oil Co..... | 103 |
| Star Ball Retainer Co..... | 99 |
| Stewart Speedometer Factory | 57 |
| Stromberg Motor Devices Co. | 45 |
| Suspension Roller Bearing Co. | 93 |
| Swinehart Tire & Rubber Co. | 98 |

M

| | |
|-----------------------------|-----|
| McCue Co. | 95 |
| McFarlan Motor Car Co..... | 99 |
| Marathon Motor Works..... | 80 |
| Marburg Bros., Inc..... | 94 |
| Marion Motor Car Co..... | 88 |
| Maxwell Motor Co..... | 1 |
| Mayo Mfg. Co..... | 79 |
| Mayo Radiator Co..... | 110 |
| Mercer Automobile Co..... | 102 |
| Metal Specialties Co..... | 84 |
| Metz Co. | 96 |
| Michener, E. S..... | 95 |
| Modern Auto Appliance Co... | 103 |
| Moon Motor Car Co..... | 96 |
| Mosler, A. R., & Co..... | 87 |
| Motor Car Equipment Co.... | 98 |
| Motor Car Supply Co..... | 103 |
| Mutty, L. J., Co..... | 103 |

T

| | |
|------------------------------|-----|
| Timken-Detroit Axle Co..... | 92 |
| Timken Roller Bearing Co.... | 92 |
| Tuthill Spring Co..... | 103 |
| 20th Century Motor Car Sup- | |
| ply Co. | 103 |
| Twitchell Gauge Co..... | 102 |

N

| | |
|------------------------------|-----|
| National Motor Supply Co.... | 103 |
| National Motor Vehicle Co... | 72a |
| New Departure Mfg. Co..... | 52 |
| New Era Spring & Specialty | |
| Co. | 103 |
| New York & New Jersey Lu- | |
| bricant Co. | 102 |
| Nordyke & Marmon Co..... | 75 |
| Norma, The, Co. of America.. | 88 |
| Nyberg Automobile Works... | 102 |

U

| | |
|------------------------------|----|
| U. S. Light & Heating Co.... | 86 |
| United States Tire Co..... | 92 |
| United Steel Co..... | 89 |

O

| | |
|---------------------------|----|
| Oakland Motor Car Co..... | 94 |
| Owen, R. M., & Co..... | 95 |

V

| | |
|---------------------|----|
| Veeder Mfg. Co..... | 84 |
|---------------------|----|

W

| | | | |
|-------------------------------|-----|------------------------------|-----|
| Packard Motor Car Co..... | 112 | Wadhams Oil Co..... | 89 |
| Paige-Detroit Motor Car Co.. | 100 | Ward, Leonard, Electric Co.. | 101 |
| Pathfinder, The, Co..... | 90 | Warner Gear Co..... | 86 |
| Peacock, Clarence N., & Co.. | 100 | Warner Mfg. Co..... | 94 |
| Pennsylvania Rubber Co..... | 96 | Weaver Mfg. Co..... | 81 |
| Pilot Car Sales Co..... | 101 | Weed Chain Tire Grip Co.... | 94 |
| Pittsfield Spark Coil Co..... | 88 | Well, R. C., Mfg. Co..... | 70 |
| Positive Tire Vulcanizer Co.. | 86 | Weston Electric Inst. Co.... | 80 |
| Premier Electric Co..... | 92 | Wheeler & Schebler..... | 46 |
| Premier Motor Mfg. Co..... | 50 | Wiley & Russell Mfg. Co.... | 81 |
| Prest-O-Lite Co. | 94 | Willard Storage Battery Co.. | 49 |
| Prosser, Thos., & Co..... | 95 | Willys-Overland Co. | 72 |
| Pullman Motor Car Co..... | 93 | Winton Motor Car Co..... | 90 |
| Pyrene Mfg. Co..... | 78 | | |

X

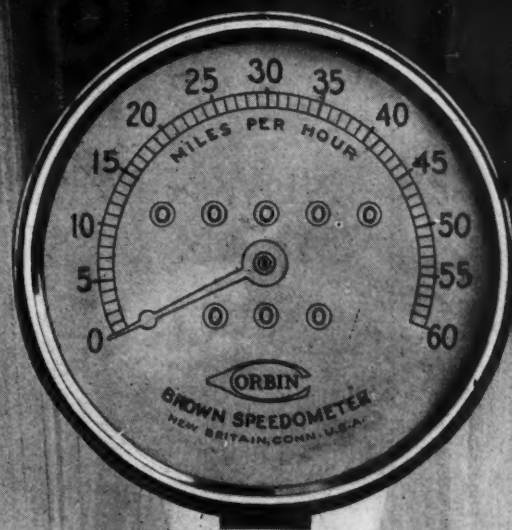
| | |
|-------------------------------|----|
| X. Y. Z., c/o Columbia Club.. | 77 |
|-------------------------------|----|

R

| | |
|---------------------------|-----|
| R. C. H. Corp..... | 94 |
| R. I. V. Co..... | 103 |
| Rayfield Carburetor | 56 |

Z

| | |
|---------------------------|-----|
| Zenith Carburetor Co..... | 102 |
|---------------------------|-----|



Increased electrical influence due to electric lighting systems, electric starting devices, etc., do not affect the accuracy of the

ORBIN-BROWN SPEEDOMETER.

"The Speedometer of Absolute Accuracy"

Specify it!

Write for Catalog

CORBIN SCREW CORPORATION

The American Hardware Corporation, Successor

NEW BRITAIN, CONN., U. S. A.

NEW YORK CHICAGO PHILADELPHIA

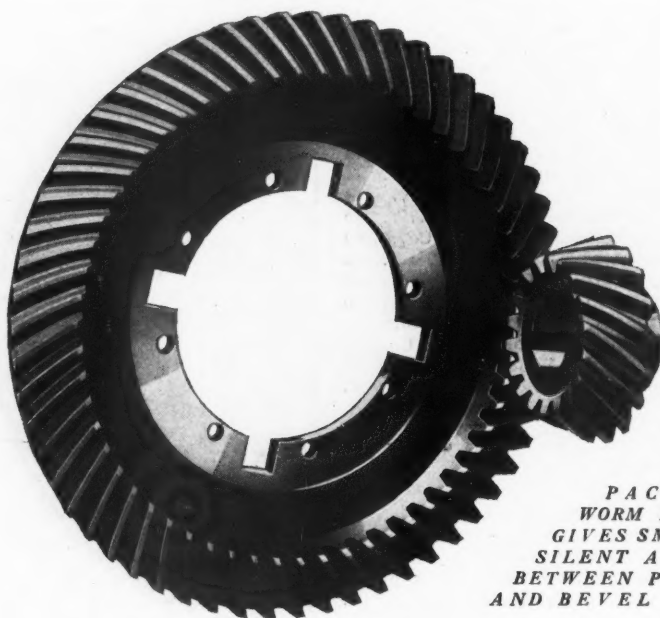
When Writing to Advertisers, Please Mention Motor Age.

"38"

Packard

"48"

NEW PACKARD WORM BEVELS MEAN A SILENT REAR AXLE



PACKARD
WORM DESIGN
GIVES SMOOTH
SILENT ACTION
BETWEEN PINION
AND BEVEL GEAR

WORM BEVEL GEARS HAVE PRODUCED AT LAST THE SILENT REAR AXLE—THE AIM OF BUILDERS SINCE HIGH GRADE CARS WERE FIRST MADE—NOW AN EXCLUSIVE FEATURE OF THE NEW PACKARD CARS.

WITH THIS ADVANCE IN DESIGN, THE FULL MEASURE OF POWER IS TRANSMITTED WITHOUT NOISE TO THE REAR WHEELS. THE ENTIRE ABSENCE OF REAR AXLE "GRIND" GIVES AN ADDED ZEST TO THE ENJOYMENT OF THE RIDE.

TO ROUND OUT THIS RESULT PACKARD SPIRAL TIMING GEARS INSURE ALSO A SILENT FRONT END.

LEFT DRIVE, LEFT HAND GEAR SHIFT, CONTROL BOARD ON THE STEERING COLUMN.

NINETEEN BODY STYLES. TOURING CAR IN EITHER SIZE, SEATS SEVEN.

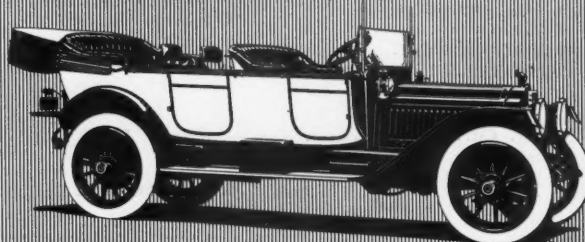
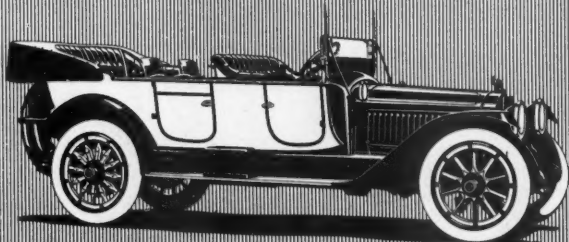
ANY PACKARD DEALER WILL DEMONSTRATE THE SMOOTH, SILENT ACTION OF THE NEW PACKARD SIXES. CATALOG ON REQUEST.

Ask the man who owns one

Packard Motor Car Company, Detroit

THE "38" TOURING CAR

THE "48" TOURING CAR



**He who buys a car
that has under its hood a**

BUDA
MOTOR

**knows that he will never meet a car
(even a \$5,000 one) with a BETTER motor.**

("There aint no such animile")

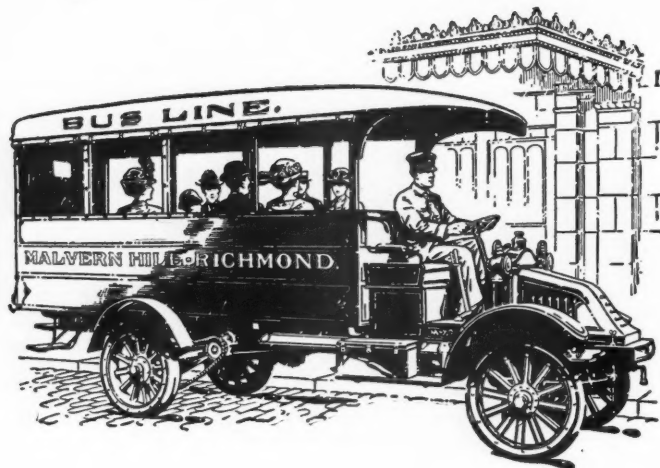
The day of the annual revolution in motor design, *the day of experiment*, is past, and everybody knows it. Most modern motors are "good" and the cry of today is for refinement of design and manufacture, "*get-at-ability*," *strength and quality of parts*—in a word, for a motor that is "right" and (above all) STAYS "right."

Common sense tells you that to get these qualities at a moderate price *absolutely requires* first, long experience in motor building *as a specialty*, and next, a very large and efficient *organization*, with the *resources* and the *equipment* to back it up.

The Buda Company, one of the pioneers of the business, and *the first in America to make motors on the "cast-in-block"* plan, has ALL these things, and that is why the saying is TRUE that the Buda Motor IS

"The Part That Sells the Car"

*The Buda Company — Factory, Harvey, Ill., (Chicago Suburb)
Address all correspondence to our Factory Representatives, Brandenburg & Company
1108 South Michigan Avenue, Chicago—57th and Broadway, New York—Ford Building, Detroit*



70 to 140 Miles Every Day

That's the steady record of the one-ton Kelly Trucks running on the Malvern Hill-Richmond Bus Line.

Each truck makes at least four trips a day between the Virginia capital and historic Malvern Hill. The distance is 18 miles and the average is 1 hour and 30 minutes.

Hundreds of Kelly Trucks are equaling or bettering this performance every day under all sorts of conditions.

Would it help your business if your wagons were able to average more than 70 miles a day? A Kelly can do it.

DEALERS!

There is still some desirable Kelly territory open. Write for our agency proposition.

**THE KELLY-SPRINGFIELD
MOTOR TRUCK COMPANY**
807 Burt Street, Springfield, Ohio